GUI Wars: The Windows Litigation and the Continuing Decline of "Look and Feel"*

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INTRODUCTION

In the early summer of 1990 the Microsoft Corporation released version 3.0 of its Windows product, an operating environment with a graphical user interface (GUI).[1] The

** Professor of Law, Saint Louis University. I extend my thanks to Alex Giftos, Tracy Litzinger, and Jeff McPherson, my research assistants.

1. Windows 3.0, 3.1, and earlier versions are not in themselves operating systems (or system software or OS) such as Microsoft/IBM DOS, Microsoft's NT, or IBM's OS/2. They require and operate "on top of" DOS 3.1 or later. Notwithstand-

introduction of Windows 3.0 was accompanied by a media blitz. Advertising of the new product was powerful and well directed,[2] and Microsoft and third party application vendors had stockpiled software designed for the new operating environment.[3] The product opened to near unani-

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ing, with the release of Windows 3.1, Microsoft began to describe Windows as an operating system. *See* Windows 3.1 outer packaging.

Operating systems are responsible for the basic operation of the computer, how it manages software and data files, allocation of processing power, memory management, input and output devices (e.g., the mouse and the video output) and peripherals such as printers, CD-ROMs, modems, and scanners. An OS should be distinguished from application programs, which perform most of the tasks PCs are used for, e.g., word processing, spreadsheets, and databases. In general, a computer will have only one OS, but multiple application programs. However, some sophisticated OSs (e.g., IBM's OS/2) contain subsets of other OSs (e.g., DOS and Windows 3.1). In addition to an OS and applications, PCs run two other types of software. Utilities are accessories designed to fine-tune or supplement the OS. They provide everything from disk de-fragmentation to memory allocation information. Mini-applications, or Applets, are small application programs that accessorize the PC. For example, Microsoft 3.1 ships with a Calendar and a flat database (Cardfile).

2. Microsoft's basic advertisements in the computer "buff" books were directed at its installed base of Windows 2.1 users (*e.g.*, "Look familiar? Then this $50 upgrade will look great." Microsoft advertisement, PC MAG., July, 1990, at 196.), and the assumed mass of DOS users apparently dissatisfied with the complexities of DOS (*e.g.*, "Kiss it Goodbye. Introducing New Windows 3.0" [over a picture of a DOS C> prompt], Microsoft advertisement, PC MAG., Sept. 11, 1990, at 2-3.). Microsoft's initial media roll-out of Windows 3.0 cost $10 million. John Markoff, *American Industry Faces the Challenge of Tougher Times*, N.Y. TIMES, Dec. 31, 1990, § 1, at 31.

3. Microsoft had been encouraging third party vendors to develop or upgrade Windows programs for more than a year prior to the public announcement of Windows 3.0. *Windows 3.0 Brings Icons, Multitasking, and Ends DOS's 640K Program Limit*, PC MAG., July, 1990, at 33; Peter H. Lewis, *In the Wings: 3 New Ways to Handle Data*, N.Y. TIMES, Mar. 13, 1990, at C10; Peter H. Lewis, *Windows, Version 3.0, Steps Out*, N.Y. TIMES, May 22, 1990, at C9. Indeed, there were so many Windows products at Comdex, the annual computer trade fair, in the fall of 1990 that the organizers announced a spin-off Windows fair. *The Executive Computer: Who Has Really Tried Windows?*, N.Y. TIMES, Dec. 2, 1990, § 3, at 8.

It was soon estimated that Windows application programs would sell 3.8 million in 1991 and 7.7 million in 1992. *Microsoft Expects Sales to Rise*, N.Y. TIMES, Mar. 26, 1991, at D5. *See* actual sales figures *infra* text accompanying note 8.

Microsoft itself had several new or upgraded programs which it heavily promoted at the same time as Windows 3.0 was announced. *E.g.*, "Microsoft Project for Windows," Microsoft Advertisement, PC MAG., July, 1990, at 2-3. Indeed, after the initial roll-out of Windows, Microsoft concentrated much of its media efforts on its own Windows applications. *See, e.g.*, "With Windows, the future takes shape. With our Windows applications, it soars." Microsoft Advertisement, PC MAG., Oct. 30, 1990, at C2-4.

mous enthusiastic reviews,[4] and sold almost three million copies in the first seven months following its introduction.[5] Subsequently, Microsoft released Windows 3.1[6] and Windows for Workgroups 3.1.[7] By the Spring of 1993 Microsoft was shipping one million copies of Windows per month,[8] and analysts believed that somewhere between twenty-five and thirty million copies of Windows were in circulation by the middle of 1993. In the third quarter of 1992, sales of key Windows applications such as word processors and spreadsheets overtook their DOS rivals,[9] and in the first

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4. *See, e.g., Windows 3.0 Brings Icons, Multitasking, and Ends DOS's 640K Program Limit*, PC MAG., July, 1990, at 33.

> A funny thing's happening on the road to OS/2. *Microsoft Windows* has turned into the dazzling multitasking operating system that OS/2 is still struggling to become. The release of *Microsoft Windows* 3.0 represents the best implementation of a graphical environment for PC users available anywhere.

See also Peter H. Lewis, *Window's, Version 3.0, Steps Out*, N.Y. TIMES, May 22, 1990, at C1; Peter H. Lewis, *Fresh Windows of Opportunity for PC Users*, N.Y. TIMES, May 27, 1990, § 3, at 9; Peter H. Lewis, *What is Windows 3.0 Really Like?*, N.Y. TIMES, May 29, 1990, at C9; Edward Rothstein, *The Computers that Mimic a Desk*, N.Y. TIMES, Sept. 6, 1990, at C1. *See* criticisms of Windows *infra* text accompanying note 44.

5. Stuart J. Johnson, *Dangerous Liaisons*, INFOWORLD, Apr. 8, 1991, at 44. There are approximately 40 million DOS users in the United States. John Markoff, *Microsoft's Payoff For Persistence*, N.Y. TIMES, Dec. 31, 1990, § 1, at 31. Microsoft's own projection, prior to launch, was that Windows would be loaded on four out of five DOS machines by 1992. Andrew Pollack, *Microsoft Tries Again to Set A Standard*, N.Y. TIMES, May 7, 1990, at D1. By early 1991, Microsoft was predicting Windows sales at 6 million for 1991. Peter H. Lewis, *Operating Systems for PC's Grow More Confusing*, N.Y. TIMES, Mar. 3, 1991, § 3, at 7. The massive acceptance of Windows 3.0 was helped by the early announcement by more than 30 hardware vendors that the environment would be included with their machines. Andrew Pollack, *Microsoft Item Gains Strong Backing*, N.Y. TIMES, May 23, 1990, at D2; Edward Rothstein, *The Computers that Mimic a Desk*, N.Y. TIMES, Sept. 6, 1990, at C1.

6. *Microsoft to Launch Windows Ads on TV*, REUTERS, Jan. 23, 1992.

7. Paul Andrews, *Premiere Performance—Curtain Raised on New Program*, SEATTLE TIMES, Oct. 28, 1992, at B7. WFW is a peer-to-peer networking product based on Windows 3.1 with additions (e.g., file and resource sharing, netware such as e-mail, and some enhancements to File Manager and the clipboard). *See generally* Amy Cortese, *VFW Beta Blazes Trail to Chicago, Microsoft Corp's Windows for Workgroups Brings 32-Bit Microsoft Windows Closer*, PC WK., June 7, 1993, at 8. WFW 3.11 was released in late 1993.

8. James Coates, *Microsoft Tries to Close a Window to Competitors*, CHI. TRIB., Mar. 1, 1993, at C3.

9. Andrew Kantor, *Registration Drives; Software Product Registration Trends*, PC MAG., Feb. 9, 1993, at 32. According to the Software Publishers Association, total DOS application sales totaled $644 million in the period, Windows sales were

quarter of 1993, sales of Windows applications had overtaken DOS applications by a margain of $669 million to $502 million.[10] Overall, sales of the Windows environment and Windows applications programs solidified Microsoft's position as the dominant and most successful software developer in the world.[11]

Against this overwhelmingly successful commercial background, Apple Corporation filed suit, charging Microsoft with violating Apple's copyrights covering the interface of the Macintosh computer. Litigation had already been recognized as a dominant, if dubious, symbol of the maturation of the computer industry in the 1990s.[12] Although there had been a rash of litigious moves by major hardware and software developers,[13] the litigation between

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$487 million. *Id. See also* Jane Morrissey, *PC Application Sales are Up*, PC WK., Nov. 30, 1992, at 166. Overall, in 1992, Windows applications almost doubled in 1992, Macintosh rose 17%, and DOS applications declined 16%. *New Users, Applications Sales Reach All-Time High*, BUSINESS WIRE, Jan. 20, 1993.

10. L.R. Shannon, *Windows Widens Its Lead*, N.Y. TIMES, Aug. 31, 1993, at C6. By this time Windows word processors were outselling DOS word processors by $122.8 million to $53.9 million. Windows Sources, Oct., 1993, at 26. In late January 1993 Word Perfect announced that it would introduce no further major upgrades to its famous DOS word processor, but it would concentrate on Windows and other GUI platforms. PC WK., Jan. 31, 1994, at 3.

11. Microsoft's 1992 revenue was $2.8 billion. Its net profit margin is 25.7%. William J. Cook & David Bowermaster, *The New Rockerfeller*, U.S. NEWS & WORLD REP., Feb. 15, 1993, at 64. Microsoft accounts for 44% of U.S. personal computer software revenues. *Microsoft to Challenge Trademark Ruling*, REUTERS, Feb. 25, 1993. In 1992, Microsoft's sales of Windows accounted for revenue of $406 million, DOS for $476 million, and application programs for $1.3 billion. James Coates, *Microsoft Tries to Close a Window to Competitiors*, CHI. TRIB., Mar. 1, 1993, at C3. Microsoft's 1993 revenues totaled $3.75 billion, including its first billion dollar quarter ($1.04 billion in the fourth quarter). Paul Andrews, *Microsoft Tops $1 Billion*, SEATTLE TIMES, July 29, 1993, at D1.

12. *See, e.g.*, Peter H. Lewis, *The Executive Computer; When Computing Power is Generated by the Lawyers*, N.Y. TIMES, July 22, 1990, § 3, at 4; *A Market's Identity Crisis*, BRANDWEEK, Sept. 1991; *Law Holds Key to High-Tech*, ARIZ. REPUBLIC, Jan. 6, 1991, at F1.

13. Most of the disputes surrounding computer software are fought in the copyright arena. However, Quarterdeck Office Systems has been awarded a patent on a windowed multi-tasking system. The patent is titled, "An Improved Display System and Memory Architecture and Method for Displaying Images in Windows on a Video Display." *Patent is Won by Quarterdeck*, N.Y. TIMES, Apr. 19, 1989, at D4. For an excellent primer on the protection of computer software, see M.A. EPSTEIN, MODERN INTELLECTUAL PROPERTY (2d ed. 1989) 363-430; *see also* Motorola, Inc. v. Hitachi, Ltd., 750 F. Supp. 1319 (W.D. Tex. 1990) (involving microprocessors); Intel Corporation's various disputes with Advanced Micro Devices Inc., over the 386

Apple and Microsoft has dominated the commercial and legal stages.

In fact, it is for both commercial and legal reasons that the importance of the Windows litigation goes far beyond the spectacle of two computer giants publicly warring. Undoubtedly copyright protection extends to the *literal* content of a software operating system or application program.[14] In contrast, the Windows litigation addresses the scope of protection extended to a non-literal feature, the user interface.[15] This question, frequently referred to as the "look and feel" issue, has immensely important commercial dimensions. First, in the short term, the victor in the Windows case would have a disproportionately large role in shaping this decade's personal computer interface. Second, in the medium to long term, interface standardization, regardless of whether it is on a Windows-like desktop metaphor, undoubtedly will continue. As such, the Windows case had the potential of predicting the degree of intellectual property protection that interface developers can expect.[16]

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chip, *Consortium to Buy Intel Computer*, N.Y. TIMES, Nov. 13, 1990, at D1; *Court Reverses Ruling on Intel*, N.Y. TIMES, June 7, 1993 at D3; Lotus Dev. Corp. v. Borland Int'l, Inc., 831 F. Supp. 223 (D. Mass. 1993) (involving a copyright claim between Lotus 1-2-3 and Borland's Quattro Pro and Quattro Pro for Windows spreadsheet applications); Everex Sys., Inc. v. Hayes Microcomputer Prods., Inc., 892 F.2d 1049 (Fed. Cir. 1989); OmniTel and Ven-Tel (involving modem escape sequences) NEWSBYTES, April 25, 1991; Borland against Symantec for alleged trade secret violations involving the hiring of Gene Wang by Symantec; criminal trade secret indictments against Wang and Symantec CEO Gordon Eubanks were returned by a California grand jury in early 1993, *Indictments Don't Deter Symantec*, PC WK., Mar. 8, 1993 at 1; Computer Associates International, Inc., successful in $8.5 million trade secrets suit against American Fundware, Inc., *Verdict in Software Case*, N.Y. TIMES, Sept. 29, 1993, at C15.

14. *See, e.g.*, RAYMOND T. NIMMER, THE LAW OF COMPUTER TECHNOLOGY, ¶ 1.02 (1991 Cum. Supp. No. 2) [hereinafter NIMMER]; Stern Electronics, Inc. v. Kauffman, 669 F.2d 852 (2d Cir. 1982); Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240 (3d Cir. 1983) *cert. dismissed*, 464 U.S. 1033 (1984); *see also* 17 U.S.C. § 101 (defining "computer program").

15. In contrast to cases where the interface is admittedly different but the underlying code is alleged to be copied, see Accolade, Inc. v. Distinctive Software, Inc., No. C9020202RFP, 1990 WL 180239 (N.D. Cal. June 17, 1990); *see also* NIMMER, *supra* note 14, at ¶ 1.03[4][b], 1.08, 1.09.

16. For example, the ability to run Windows is a practical requirement for any OS in the short term market. Obviously, Microsoft's NT has that ability, as has IBM's OS/2 by virtue of a licensing agreement with Microsoft. However, Microsoft

This article traces the course of the Apple-Microsoft litigation, providing a commercial and technological perspective. It includes an analysis of the major cases concerning non-literal copying in the software arena, and concludes that Microsoft's apparent victory in the litigation[17] was consistent with a jurisprudence reflecting a steady decline in the degree of copyright protection granted to user interfaces.

I. THE DEVELOPMENT OF THE GRAPHICAL USER INTERFACE

The Xerox Corporation developed the desktop metaphor/windows style interface at its Palo Alto Research Center (PARC) in the mid-1970s. It originated with a computer language, called Smalltalk, which accommodated non-keyboard (mouse) input and overlapping windows.[18] Subsequently, Xerox developed the Star workstation project which first mated mouse input with graphical images.[19] Considering that the GUI would require hardware so expensive as to render the project impractical, Xerox decided

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has not granted licenses to other OS manufacturers such as Sun Microsystems which has demonstrated an OS which can run Windows applications. *See* John Markoff, *Sun Operating System Is Aimed at PC Market*, N.Y. TIMES, Mar. 30, 1993, at D6. Asked to comment, a Microsoft vice-president intimated that Microsoft would maintain its competitive edge by adding new technologies rather than rushing to the courts. *Id.* It should also be noted that the IBM-Microsoft cross-licensing agreement came to an end on September 17, 1993. This is likely to hinder OS/2 in attempting to run Windows 4.0 or DOS 7.0. *See, e.g.,* Amy Cortese, *Will OS/2 Roads Diverge With MS-DOS 7.0; Incompatibilities Between IBM's OS/2 Operating System and Future Versions of Microsoft's MS-DOS 7.0 Operating System*, PC WK., Aug. 23, 1993, at 1, Aug. 23, 1993, at 1.

17. At the time of writing Microsoft had been granted summary judgment. No decision regarding any appeal had been made public.

18. Smalltalk has evolved into an object oriented programming language which competes with C++. Versions of the Smalltalk language are currently available from several independent vendors. *See* Jack E. Gold, *Reusability Promise Hinges on Libraries*, SOFTWARE MAG., Jan., 1993, at 86. It is available as a Windows programming language. Kaare Christian, *Smalltalk: The Granddaddy of OOPS Meets Windows*, PC MAG., May 28, 1991, at 49. Smalltalk /V 2.0 for OS/2 was released in September, 1992, Larry J. Seltzer, *Cross-platform Tools Make a Splash*, PC WK., Dec. 28, 1992, at 75.

19. However, only one Window could be active. AT&T has recently begun asserting a patent it says applies to allowing multiple Windows to be active. John Markoff, *Patent Action on Software by AT&T*, N.Y. TIMES, Feb. 26, 1991, at D1.

not to market it.[20] In December 1979, Xerox twice demonstrated the never copyrighted Smalltalk to Apple personnel visiting PARC, including Steven Jobs, who was then the president of Apple.[21] Subsequently, and pursuant to a licensing agreement with Xerox, Apple began to develop the Lisa computer as a hardware system for Smalltalk.[22] At this time, Jobs also recruited some Xerox personnel from PARC to work for Apple on the Lisa project.[23]

At the heart of Apple's efforts was the availability of Motorolas 32-bit 68000 microprocessor for personal computer application. The 68000 proved to be sufficiently powerful for Apple to reproduce the bit mapped GUI that previously had required workstation processing power,[24] the technical requirement that had led Xerox to abandon any leading role in the development of a GUI. Introduced in January 1983, the Lisa was a $10,000 flop when it was compared to IBM's less powerful $2,000 PCs. However, the more competitive Macintosh, its interface derived from Lisa, was announced by Apple Corporation in January 1984.[25] Aspects of the visual displays of both Lisa and Macintosh are registered copyrights.[26]

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20. QUE'S COMPUTER USER'S DICTIONARY 278 (3d ed. 1992).

21. Xerox Corp. v. Apple Computer, Inc., 734 F. Supp. 1542, 1543-44 (N.D. Cal. 1990); *see, e.g.*, Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006, 1017-20 (N.D. Cal. 1992).

22. 734 F. Supp. at 1543-44.

23. 799 F. Supp. at 1018; QUE'S COMPUTER USER'S DICTIONARY 278 (3d ed. 1992).

24. 799 F. Supp. at 1018-19.

25. Andrew Pollack, *Apple Expands Product Line*, N.Y. TIMES, Jan. 16, 1984, at D1. Judge Walker, the second judge to oversee the later Apple-Microsoft litigation summed up the breakthrough as follows:

> In developing the Macintosh computer operating system software, Apple made one of the major commercial breakthroughs of the 1980s. The graphic user interface generated by the Macintosh system software consists of windows, icons, pull-down menus, and other images or visual displays projected on the computer screen. The Macintosh user interface proved so intuitive that users were able fairly quickly to learn how to manipulate the screen displays and mouse and thus accomplish what had theretofore been the daunting task of learning to operate a computer. This breakthrough vaulted Apple to the top of the personal computer industry.

Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444, 1447 (N.D. Cal. 1991) (footnote omitted).

26. Xerox Corp. v. Apple Computer, Inc., 734 F. Supp. 1542, 1544 (N.D. Cal. 1990).

Apple introduced the Macintosh with a spectacular commercial during the January 1984 Super Bowl.[27] Although highly regarded, the Macintosh failed to establish itself as a business machine until the 1986 release of the LaserWriter, a laser printer utilizing Adobe Systems PostScript printer language.[28] This combination of printer and computer quickly set the benchmark for desktop publishing, giving Apple a product that it could market beyond the school and home markets.[29]

By this time, the Intel Corporation, the preeminent manufacturer of microprocessors for IBM-compatibles, had developed chips that were able to rival Motorola products in handling complex bit-mapped graphics.[30] Microsoft, already a Macintosh GUI applications developer, first disclosed its Windows project for previously character-based IBM compatibles in late 1983.[31] However, its final stage of development reportedly was "buggy," and its introduction was delayed until 1985.[32] Even then, Windows was perceived as slow,[33] and it was not until the 1987 introduction of version 2.0 that the environment began to make serious converts.[34]

Microsoft was not alone in seeking to produce the first PC GUI to challenge the Macintosh.[35] However, early

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27. Phillip H. Dougherty, *The Other Superbowl: I.B.M. vs. Apple*, N.Y. TIMES, Jan. 23, 1984, at D11. The 1984 Superbowl was won by the Los Angeles Raiders over the Washington Redskins, 38-9.

28. QUE'S COMPUTER USER'S DICTIONARY 367 (3d ed. 1992). Of particular importance is PostScripts outline font technology. *Id.* at 470-72.

29. An additional reason was the shift from the closed-bus design of the Macintosh to the open-bus design of the Mac II in 1987, encouraging the development of third party peripherals. QUE'S COMPUTER USER'S DICTIONARY 366 (3d ed. 1992).

30. Initially the 286, subsequently the 386 and 486 families. *See infra* note 47. The Pentium chip, renamed from 586 to ease trademark protection, was introduced in mid-1993.

31. *Microsoft Displays Window Program*, N.Y. TIMES, Nov. 11, 1983, at D4.

32. Peter H. Lewis, *Special Insurance Coverage Could Prevent Costly Losses*, N.Y. TIMES, Oct. 30, 1984, at C6.

33. *See, e.g.*, Nico Krohn, *Not as Easy as 1-2-3*, INFOWORLD, Apr. 1, 1991, at 40.

34. Andrew Pollack, *Microsoft Tries Again to Set a Standard*, N.Y. TIMES, May 7, 1990, at D1. In contrast, version 3.0 was considered a breakthrough because of its memory management techniques and its graphics.

35. Including GEM (Graphics Environment Manager) from Digital Research, Topview from IBM, and Visicorp (Visi-On). Erik Sandberg-Diment, *Macintosh Marketing Overcomes its Drawbacks*, N.Y. TIMES, Mar. 26, 1985, at C4; Andrew

graphical or windowing environments were poorly received. Among the problems with the early environments were the insufficiency of programs to run under the new environments, more could be achieved with less by running integrated software,[36] and the then current video displays were ill-suited to displaying a collection of relatively small icons or windows.[37] By the time Microsoft announced version 3.0,[38] the only real contenders in the mass market GUI competition were Apple, with its proprietary Macintosh operating system,[39] OS/2,[40] UNIX,[41] and NextStep.[42]

Pollack, *Integrating the Software*, N.Y. TIMES, Dec. 1, 1983, at D2; Erik Sandberg-Diment, *"Windows" and "Gateways" Loom in Near Future*, N.Y. TIMES, Dec. 6, 1983, at C6. In 1988, Microsoft and IBM announced the readiness of Presentation Manager, the GUI front end for OS/2. Peter H. Lewis, *New Graphics Interface*, N.Y. TIMES, Nov. 1, 1988, at C10; *see, e.g.*, Nico Krohn, *Not as Easy as 1-2-3*, INFOWORLD, Apr. 1, 1991, at 40. The different GUI front-end developed and used by IBM in OS/2 2.x is called WorkPlace Shell. Additionally, the narrower multitasking challenge for machines using Intel's 386 has been addressed by software packages such as DESQview from Quarterdeck Office Systems. A more GUI version DESQview/X was introduced in 1992. Paul Lavin, *DESQview/X Graphical User Interface*, PC USER, June, 1992, at 42.

36. The 1980s also saw the introduction of several fully integrated software packages such as Lotus's Symphony, Ashton-Tate's Framework and Microsoft's Works. David E. Sanger, *Lead Widens for a Few*, N.Y. TIMES, May 28, 1984, at B33. Typically, such programs would contain a word processor, spreadsheet, database, and communications software all sporting similar interfaces. The early-1990s have shown a tendency to abandon horizontally integrated software for the business environment in favor of an *integrating* environment in which disparate programs from different manufacturers are designed to work cooperatively. Christina Cordova & Nate Zelnick, *Professional Write Plus Fills the Windows Word Processing Gap*, PC MAG., Apr. 16, 1991, at 55.

37. Erik Sandberg-Diment, *Value of Windowing is Questioned*, N.Y. TIMES, Dec. 25, 1984, § 1, at 35.

38. Subsequent to the release of version 3.0, eight 32-bit operating systems were considered viable contenders: NeXT, Taligent's Pink, Solaris, IBM's OS, IBM/Apple/Motorola's PowerOpen (which will power the PCOpen chip), Microsoft's NT, Chicago (Windows 4.0) and Cairo (Microsoft's object-oriented OS). Alyson Preston, *32-Bit OSs Ready to Take Hold*, PC WK., Mar. 29, 1993, at 103-04. In August, 1993, Motorola (the joint developer of the PowerPC with Apple and IBM) announced that it had reached agreement with Microsoft to allow it to modify the NT OS to work on the power PC. Ronald Yates, *Motorola Buys Rights to Windows*, PHOENIX GAZETTE, Aug. 10, 1993, at B9.

39. System 7, the latest version of the Macintosh operating system was introduced in May, 1991. System 7 competes directly with Windows 3.0 (in fact, with 3.1 which was introduced in mid-1991) with regard to virtual memory and font technology. *See, e.g.*, Advertisement, N.Y. TIMES, May 7, 1991, at C1.

40. Peter H. Lewis, *In the Wings, 3 New Ways to Handle Data*, N.Y. TIMES, Mar. 13, 1990, at C10; *see, e.g.*, Peter H. Lewis, *War for the Desktop*, N.Y. TIMES,

Oct. 9, 1990, at C10. Additionally, PC/GEOS, a new entry, has been well received. *E.g.*, Milt Jones, *GeoWorks Ensemble Lays the Foundation For A Brave New OS*, PC MAG., Feb. 12, 1991, at 29. Another kernel for the development of various APIs is X-Window. Kaare Christian, *The X Window System: A Universal Graphic Interface*, PC MAG., May 28, 1991, at 323. The relatively poor initial acceptance of OS/2 in the marketplace coupled with Microsoft's continual development of Windows has led to several public restatements or reassessments of the IBM-Microsoft relationship. *See, e.g.*, Peter H. Lewis, *IBM and Microsoft Try for a Truce*, N.Y. TIMES, Nov. 19, 1989, § 3, at 13; Andrew Pollack, *I.B.M. Reported in Dispute with Microsoft on Software*, N.Y. TIMES, Sept. 17, 1990, at D8; Andrew Pollack, *I.B.M. and Microsoft Revise Software Pact*, N.Y. TIMES, Sept. 18, 1990, at D1; John Markoff, *I.B.M. Going on Offensive to Promote Key Software*, N.Y. TIMES, Apr. 15, 1991, at D1; Andrew Pollack, *One Day Junior Got Too Big*, N.Y. TIMES, Aug. 4, 1991, § 3, at 1. Microsoft was selling only about 150,000 copies of OS/2 annually. For some speculation on the present and future relationship between Windows and OS/2, see John Dvorak, *OS/2's Flop: Why Did it Happen?*, PC MAG., May 14, 1991, at 81; *see also* John Markoff, *Rift on Software Arouses Concerns*, N.Y. TIMES, Sept. 24, 1990, at D1.

After the effective breakup of the joint IBM-Microsoft development of OS/2, IBM released OS/2 2.0 in 1992. This release garnered considerably more favorable reviews than OS/1.0, and has been better received in the marketplace. *See, e.g.*, John Dvorak & Paul Somerson, *Good Things Can't Last Forever: The Command Line Gives Way To The GUI*, PC MAG., July, 1992, at 90; Michael J. Miller, *The 9th Annual Awards for Technical Excellence*, PC MAG., Dec. 22, 1992, at 108. OS/2 2.1 was released in mid-1993 to very favorable reviews. *See* Bill Machrone, *Your Next Operating System?*, PC MAG., Sept. 14, 1993, at 87; John C. Dvorak, *OS/2 Then and Now*, PC MAG., Sept. 14, 1993, at 93.

IBM and Microsoft settled their intellectual property issues in the summer of 1992. Larry Black, *IBM and Microsoft Settle their Disputes*, THE INDEPENDENT, June 30, 1992.

41. UNIX is the pre-eminent operating system (or rather systems—there are approximately 25 different species of UNIX) for workstation and mini-computer platforms. A leading version of the UNIX system is produced by Santa Cruz Operation Inc.; that version, like DOS and Windows, runs on Intel-based computers. Lawrence M. Fisher, *Small Software Maker Is Taking Giant Steps*, N.Y. TIMES, Jan. 4, 1991, at D1; *see, e.g.*, John Markoff, *Fresh Momentum for UNIX, But Still Hurdles to Clear*, N.Y. TIMES, Oct. 7, 1990, § 3, at 10; Quadibur R. Safi, *Santa Cruz Operation's SCO UNIX Deserves Its Place in the Sun*, PC WK., Aug. 9, 1993, at 81 (previewing SCO version 3.0). Sun MicroSystems also has announced a version of its Solaris OS which will run on IBM-compatibles. John Markoff, *Sun Operating System is Aimed at PC Market*, N.Y. TIMES, Mar. 30, 1993, at D6. For a comprehensive comparison of UNIX to Windows NT, see Tom Yager & Ben Smith, *Is Unix Dead?*, BYTE, Sept., 1992, at 134. In March, 1993, six leading UNIX OS developers (IBM, Hewlett-Packard, Sun Microsystems, Santa Cruz Operation, Univel, and UNIX System Laboratories) announced an agreement to standardize their UNIX OS products in the face of Windows NT. Steve Lohr, *6 Rivals to Head Off A New Microsoft Challenge*, N.Y. TIMES, Mar. 17, 1993, at C3; *see, e.g.*, John Pallatto & Norvin Leach, *Unified UNIX is Battle Cry of COSE Group*, PC WK., Mar. 22, 1993, at 1 (detailing aspects of the so-called Common Open Software Environment or COSE).

42. The NextStep OS, which is UNIX-based, was developed by Steve Jobs to run on his Next workstation. A version of NextStep has been developed that will run on high end Intel-based machines. *See, e.g.*, Mark Potts, *Leaning Hard on*

II. A TECHNICAL AND COMMERCIAL PRIMER

Although immensely popular, Windows 3.x[43] has not escaped criticism. The first release was not completely stable particularly when running DOS applications. However, most bugs had been removed by the time version 3.1 was shipped. A more fundamental criticism incurred by Windows is that placing an ostensibly modern operating environment on top of the venerable DOS operating system[44] distracts from the powerful and integrated operating systems (OS) of the future.[45] What has become clear is that some type of Windows-like desktop metaphor[46] will dominate the present and next generations of personal computers and workstations.

In one package Windows 3.x offered the user of an IBM-compatible PC a colorful and intuitive graphical user interface, powerful memory management for the newer generations of micro-processors, and protected mode multitasking. Crucially, perhaps even luckily, the appearance of Windows 3.0 on the market coincided with the increasing

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Software, WASH. POST, Nov. 22, 1992, at H1. In early 1993, Next announced that it was leaving the hardware business and would be concentrating on its OS business. Next is reported to be looking for an alliance with an applications developer. Cate Corcoran, *The "Next Step" for Next is Finding a Software Developer*, INFOWORLD, Mar. 22, 1993, at 6. For a review of the beta of NextStep 3.1, see Quadibur R. Safi, *NextStep Dazzles on Intel-systems*, PC WK., Apr. 5, 1993, at 24.

43. This article adopts the computer industry convention of referring to software releases with a wildcard character. Thus, 3.x refers to both versions 3.0 and 3.1.

44. This causes at least two problems. First, DOS, and so most of Windows, is limited to 16-bit operation. Most modern processors will handle 32-bit traffic. (Windows 3.1 has 32-bit disk access and the WFW 3.11 beta sported a 32-bit file system. Stuart J. Johnston, *VFW Upgrade Adds 32-bit File System*, INFOWORLD, Mar. 8, 1993, at 99). Second, although Windows 3.x is a multi-tasking environment, it lacks the pre-emptive multi-tasking of a multi-threaded OS like NT.

45. *See, e.g.*, John C. Dvorak, *Windows, The Mac And DOS*, PC MAG., Jan. 29, 1991, at 81; Bill Machrone, *Welcome to Windows; Bring Your Checkbook*, PC MAG., Feb. 12, 1991, at 75; William F. Zachmann, *Windows, Now And Forever?*, PC MAG., May 28, 1991, at 95.

46. Current computer interface design favors a desktop metaphor, in which the screen is viewed as an electronic desktop upon which various tasks may be viewed in various stages of completeness. *See* QUE'S COMPUTER USER'S DICTIONARY, 180 (3d ed. 1992) ("a computer representation of your day-to-day work, as if you were looking at an actual desk littered with folders full of work to do").

availability of relatively inexpensive 386-based PCs,[47] dramatically declining memory chip prices, and industry standardization around color VGA displays.

With Windows 3.x, Microsoft went far beyond prior versions. It took an improved Windows 2.03 interface and mated it to memory and processing managers that took advantage of the 386 microprocessor, including true multitasking, access to virtual memory, and protected mode processing for multiple DOS sessions. Microsoft's competitors, particularly Apple, and some of its apparent allies were less than enthused by the success of Windows.

The discrete legal dispute between these two highly successful founding members of the personal computer revolution concerned Apple's allegation that Microsoft Windows violates the former's copyrights in the Lisa and Macintosh visual displays, principally their windowing abilities.[48] However, the litigation must also be viewed in the context of various sub-texts taking place contemporaneously, not all of which directly affected Apple but clearly implicated Microsoft.

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47. The first 386-based machines were shipped by Compaq in 1986. Jonathan Weber, *A Little Computer With Big Impact*, L.A. TIMES, Aug. 9, 1991, at D1. However, it was another 2 years before the 386 machine became the business standard, and it was not until the introduction of lower-priced 386SX machines that smaller businesses and the home market were taken with the machine.

48. This in itself was not without inconsiderable consequences. Apple originally claimed $4.37 billion in damages, $3.02 billion for lost profit regarding the interface, $1.35 billion relating to application programs. *Apple Seeking $4.37 billion from Microsoft*, UPI, Feb. 11, 1992. Subsequently, Apple increased that estimate to $5.5 billion, $3.12 billion for lost Macintosh sales, and $2.43 billion for Microsoft's Windows and Windows applications profit. NEWSBYTE NEWS NETWORK, Mar. 20, 1992. One unsubstantiated rumor is that Apple rejected a $500 million settlement. Laura Ramsay, *Apple's Lawsuit Trying to Close Microsoft's Windows*, FINANCIAL POST, Mar. 9, 1992, at S21.

The original suit called for impoundment and destruction of copyright violating works. O. Casey Corr, *Apple May Broaden Microsoft Lawsuit*, SEATTLE TIMES, Apr. 17, 1991, at B1. Because of the likelihood that Apple also would demand changes in the Windows interface, Microsoft was believed to have made some contingency design plans. Beth Friedman, *Microsoft Considers Options in Look-and-Feel Lawsuit*, PC WK., Feb. 17, 1992, at 120. In a 1992 interview Bill Gates referred to $10 million in cost, presumably the legal cost associated with the defense of the Apple suit. Rich Karlgaard, Interview, *Bill Gates*, FORBES, Dec. 7, 1992, at 63.

First, Windows 3.x is not just a discrete product, but also the lynch-pin of Microsoft's broad post-DOS[49] strategy. Windows 3.1 and its peer-to-peer sibling Windows for Workgroups 3.1 and 3.11 will be replaced by a single product, Windows 4.0, codenamed "Chicago," in late 1994.[50] Positioned above the single desktop/peer-to-peer 4.0, but still displaying the Windows-family GUI is the cross-platform, heavy duty, developer-oriented, client-server Windows NT[51] and its successor, codenamed "Cairo."[52] Positioned "below" Windows 4.0 will be "modular Windows" for consumer products, such as microwave ovens, cable television boxes,[53] as well as VCRs, and office machines, such as photocopiers.[54] "Modular windows" will run a scaled back version of Windows 3.x.[55]

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49. DOS 6.0 shipped in early Spring, 1993. A maintenance release, dubbed 6.2 is due in Fall 1993. DOS 7.0 which has been jointly developed with Windows 4.0 (joint codename "Chicago") will ship in late 1994. Some aspects of Chicago may ship in the late 1993 version of WFW. Amy Cortese, *WFW Beta Blazes Trail to Chicago*, PC WK., June 7, 1993, at 8.

50. Windows 4.0 ("Chicago") will be a stand-alone OS with 32-bit code support which will not require DOS. Stuart J. Johnson, *Blueprint for Windows 4 leaves DOS in the Dust*, INFOWORLD, Mar. 15, 1993, at 1; *see also Chicago Nears Beta Testing*, PC WK., Aug. 30, 1993, at 1; *see, e.g.*, Eamonn Sullivan & Larry J. Seltzer, *Chicago Beta Radically New*, PC WK., Sept. 13, 1993, at 12.

51. Windows NT, which is derived from what Microsoft/IBM OS/2 3.x would have been, comes in two versions, server ("NT Advanced Server") and desktop. Robb Car, *NT Networking*, INFOWORLD, Mar. 15, 1993, at 1. NT shipped in Summer 1993.

The kernel of NT, the New Technology Operating System or NTOS, will run on different hardware platforms (e.g., UNIX workstations and PCs) and support different user interfaces (e.g., either the Windows or the Presentation Manager Application Program Interface (API)). Peter H. Lewis, *The Executive Computer*, N.Y. TIMES, Mar. 3, 1991, § 3, at 7; Bill Machrone, *The Emperor's New Operating System*, PC MAG., May 28, 1991, at 75. Reportedly, Apple is working on a similar project. Andrew Pollack, *Apple May Widen Sales of Operating Systems*, N.Y. TIMES, Mar. 19, 1991, at D2.

52. This more object-oriented development of NT will follow in 1994/1995. *See, e.g., Microsoft Pushes Cairo Pace*, PC WK., Sept. 27, 1993, at 8.

53. In April, 1993 Microsoft, Intel, and General Instrument signed an agreement to produce "intelligent" cable boxes, the first versions to use the Intel 386 microprocessor and a scaled back version of Windows. John Markoff, *Battle Looms for Control of TV's Portal to Cable*, N.Y. TIMES, Apr. 3, 1993, § 1, at 43.

54. *See, e.g.*, Steve Lohn, *Software Giant Aiming at the Office*, N.Y. TIMES, June 9, 1993, at D1.

55. Microsoft has also introduced a telephone API. *Windows to Swallow Phones*, INFOWORLD, Mar. 1, 1993, at 1. Application programming interfaces are

The glue holding together this horizontally and vertically expanding family of operating systems is the Windows interface.[56] As the IBM-Microsoft alliance broke down, leading to both parties developing separate, albeit partially cross-licensed, 32-bit, multi-threaded OS projects,[57] Microsoft's dominance of the OS market ceased to appear quite so absolute. IBM quickly joined Apple in creating the Taligent partnership to produce an object-oriented OS, sometimes referred to as "Pink."[58] In 1991, Novell acquired Digital Research, Inc.,[59] and in 1993, it purchased Unix System Labs from AT&T.[60] It was crucial to Microsoft that Windows 3.1 should both maintain the OS market until its new products like NT and Chicago were ready, and provide a clear migration path to those advanced systems for users and developers. Any legally induced pause in the develop-

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subroutine calling conventions. *See* WOODY LEONHARD, WINDOWS 3.1 PROGRAMMING FOR MERE MORTALS 21 (1992).

56. Both Chicago and Cairo will have revamped interfaces. *See, e.g.*, Eamonn Sullivan & Larry J. Seltzer, *Chicago Beta Radically New*, PC WK., Sept. 13, 1993, at 12.

57. OS/2 1.x was jointly developed. OS/2 2.x which began as a joint development became an IBM exclusive product. What would have been OS/2 3.x became Microsoft NT.

58. *See, e.g.*, Ed Scannell, *But Will It Have Any Impact*, INFOWORLD, Oct. 21, 1991, at 48.

There was speculation at the time of the announcement of Taligent that IBM was partly motivated by the thought that Apple might win the copyright suit and strand IBM-compatible users and OS developers without rights to a graphical interface. *See* Lawrence Curran, *A Big Blue Hue for Apple*, ELECTRONICS, Aug., 1991, at 27; *see also* Evelyn Richards, *Apple Chairman Upbeat on Long-Term IBM Deal*, THE WASH. POST, Aug. 2, 1991, at D1.

As Microsoft views Windows as a migration path to Windows NT and its future object-oriented OS (codename Cairo), so IBM is trying to position OS/2 as a migration path to Taligent. For example, in March 1993 IBM announced that the Taligent interface will work on top of the OS/2 kernel. There are reports that Apple is also working on a revision of its System 7 OS (codename Jedi) which can be ported to other systems including Windows. Amy Cortese, *Apple Companion to Propel Coveted Macintosh Features into Mainstream*, PC WK., Apr. 26, 1993, at 1.

59. Digital Research, Inc. is the manufacturer of DR. DOS. *See infra* note 68. Revised versions of DR. DOS, entitled "Novell DOS" and "NetWare DOS" are due to be released by Novell in the fall of 1993. PC MAG., Apr. 13, 1993, at 124. For enthusiastic advance reviews see *The Next Generation Publisher*, PC WORLD, Oct., 1993, at 89; PC WK., Oct. 4, 1993, at 1.

60. *See, e.g.*, Jim Seymour, *Novell and UNIX: A Good Fit*, PC MAG., Mar. 30, 1993, at 99.

ment of the Windows line of OS products would seriously damage and possibly destroy Microsoft's strategy.[61]

Second, DOS application software is individualized, even quirky, with different application developers stressing very different aspects of a very plain interface. For example, WordPerfect for DOS makes extremely heavy use of function keys, whereas Lotus 1-2-3 for DOS uses the slash key to access layers of menus. In contrast, a graphical interface with an agreed metaphor such as the Macintosh, Windows, or the Windows-derived Presentation Manager in OS/2, both invites and requires considerable standardization.[62] DOS may have been the almost universal choice as an OS and highly profitable for Microsoft, but it played a relatively minor role in setting standards for application software. In contrast, whichever company ends up controlling the interface of the next major OS would have just that influence. It might be what is called an open standard, but it would be centrally influenced by the OS developer.[63]

Third, in enterprise computing environments the use of mainframe computers has persistently declined; the mainframes are being replaced by networks of mini-computers, workstations, or PCs. The major software developers are engaged in a battle for the control of networking and, *a for-*

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61. In a 1991 memo, Microsoft chairman Bill Gates was reported to have warned that the loss of the suit could be "disastrous." Jane Morrissey, *"Look-and-Feel" Suit by Apple Misses Mark Against Microsoft*, PC WK., Apr. 27, 1992, at 137.

62. At a simple level this explains the CUA keyboard assignments used in Windows (e.g., Alt+F,X always closes an application). At a more complex level, the OS designer has considerable influence on driver design and behavior, and APIs application programming interfaces).

63. Control of an "open standard" may have been the motivation for the Novell acquisition of UNIX Labs. *See supra* note 60. Following the mid-1993 release of Windows NT, Novell responded with a proposal to make UNIX truly open by providing it free to X/Open Inc., an industry consortium based in London, England. *Novell Seen to Open UNIX*, N.Y. TIMES, Sept. 20, 1993, at D6. Subsequently, some of the major UNIX developers balked at adopting Novell's UnixWare as the UNIX standard. PC WK., Sept. 27, 1993, at 1; *see, e.g.*, Lawrence M. Fisher, *New Crusader in Software's Holy War*, N.Y. TIMES, Oct. 3, 1993, § 3, at 7. However, after a delay the rights were transferred. Lawrence M. Fisher, *Novell to Let Industry Group Have UNIX Software Rights*, N.Y. TIMES, Oct. 11, 1993, at D4.

Some question whether Microsoft may be more interested in a "closed system" such that applications developers would have to pay a license fee for their products to run on Windows. *See* John C. Dvorak, *Will Windows Turn Proprietary?*, PC MAG., Aug., 1993, at 93.

tiori, network operating systems.[64] Analysts have long considered the lack of a successful networking product to be the major weakness in Microsoft's product line.[65] In contrast, Apple's Macintosh computers have had networking capabilities built in for some time, and, with the deterioration of its relationship with IBM, Microsoft lost its most network-aware partner. Microsoft's networking strategy is linked inextricably with its Windows strategy, Windows for Workgroups for small and peer-to-peer networks, NT for larger client-server systems. Losing the Windows edge, both as a migration path and from the perspective of interface design, would not only shift networking momentum from Microsoft back to Apple, but also empower further Novell, the dominant network developer.[66]

Fourth, the Windows case was not Microsoft's only legal worry in the early 1990s. Microsoft has been the frequent target of accusations from other software manufacturers regarding some of its trade practices.[67] Coincident with the Apple litigation striking at Windows, Microsoft's

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64. There are three broad groups of networks: peer-to-peer, local area networks (LANs), and wide area networks (WANs). For a comparison of the major networking systems, see Frederic Paul, *AppleTalk Router First to Debut with AURP Support*, NETWORK WORLD, Jan. 18, 1993, at 21.

65. *See, e.g.*, Andrew Pollack, *One Day Junior Got Too Big*, N.Y. TIMES, Aug. 4, 1991, § 3, at 1.

66. Novell shipped Netware 4.0 in April, 1993. Peter H. Lewis, *The Executive Computer*, N.Y. TIMES, Mar. 28, 1993, § 3, at 8. Novell and Microsoft crossed swords in late 1992 over allegedly unauthorized use of Novell's IPX code in Windows for Workgroups. Paul Andrews, *High Technology — Microsoft, Novell Quarrel Over License*, SEATTLE TIMES, Nov. 2, 1992, at F1. WFW competes in the same market as Novell's Netware Lite. Novell is widely reported to be Microsoft's litigation nemesis, and hired two Washington law firms (Ablondi & Foster and Arnold & Porter) to state its antitrust allegations. Wendy Goldman, *Novell Hires 2nd Law Firm for FTC-Microsoft Case*, PC WK., June 21, 1993, at 10. At Microsoft's annual financial analysts meeting in July, 1993, Microsoft chairman Bill Gates described Novell's involvement as "an increasingly paranoid political attack." Amy Cortese & Jane Morrissey, *Gates Blasts Novell "Vendetta,"* PC WK., Aug. 2, 1993, at 10.

67. *See, e.g.*, Andrew Pollack, *One Day Junior Got Too Big*, N.Y. TIMES, Aug. 4, 1991, § 3, at 1. According to the book "Computer Wars," by Charles Ferguson and Charles Morris, Bill Gates "is the most hated man in the computer industry." For portraits of Gates see Fred Moody, *Mr. Software*, N.Y. TIMES, Aug. 25, 1991, § 6, at 26; Kathleen K. Wiegner & Julie Potta, *Can Anyone Stop Bill Gates*, FORBES, Apr. 1, 1991; Kathy Rebello, *Bill Gates' Baby is on Top of the World. Can it Stay There?*, BUSINESS WK., Feb. 24, 1992, at 60; Rich Karlgaard, Interview, *Bill Gates*, FORBES, Dec. 7, 1992, at 63.

core product, the Federal Trade Commission announced an inquiry into Microsoft's business practices,[68] and antitrust allegations are now the subject of Justice Department[69] and DG-IV investigations.[70]

Unsubstantiated allegations against Microsoft include patent infringement (see, e.g., the patent infringement action brought by Stac Electronics over the disk compression features in DOS 6.0. AP, Jan. 26, 1993. Microsoft countered with an allegation that Stac's patent was invalid. PC WK., Mar. 8, 1993, at 6.) and stealing ideas in the course of considering collaboration. *See, e.g.,* O. Casey Corr, *Hi-tech-Microsoft Plays Hardball - Some Question Its Growing Dominance*, SEATTLE TIMES, Apr. 8, 1991, at B1; Kathy Rebello, *Is Microsoft Too Powerful*, BUSINESS WK., Mar. 1, 1993, at 82.

68. *See, e.g., Microsoft: Predator or Tough Rival?*, DALLAS MORNING NEWS, Nov. 28, 1992, at 1; Lawrence M. Fisher, *Microsoft in Inquiry by FTC*, N.Y. TIMES, Mar. 13, 1991, at D1; Andrew Pollack, *Microsoft's Tactics Questioned by Rivals*, N.Y. TIMES, Mar. 15, 1991, at D1; Lawrence M. Fisher, *Microsoft Says FTC has Expanded Inquiry*, N.Y. TIMES, Apr. 13, 1991, § 1, at 39. Although, initially, an apparently wide-ranging investigation, this FTC probe was soon narrowed down to concerns over the original IBM-Microsoft agreement regarding DOS and Microsoft's licensing practices with regard to DOS. Microsoft is the overwhelmingly dominant supplier of the basic PC OS. Its only competitor is DR DOS, a product which has long been considered technically or feature superior. *See* Winn L. Rosch, *DR Dos 5.0; The Better Operating System?*, PC MAG., Feb. 12, 1991, at 241. DR DOS was developed by Digital Research, Inc., which was acquired by Novell in the summer of 1991. *See* Jane Morrissey & Paul M. Sherer, *Novell to Buy DRI in Bid for OS Claim; Competition in Operating System Market Includes Related Article on Novell Inc., Digital Research Inc. Merger*, PC WK., July 22, 1991, at 1 (DR DOS 5.0 compared to DOS 4.01); Stan Miastkowski, *Digital Research Creates a Better DOS*, BYTE, Nov., 1991, at 68 (DR DOS 6.0 compared to DOS 5.0). The FTC's investigator's theory was that Microsoft's licensing practices for the distribution of DOS by computer manufacturers (per processor pricing) effectively precluded competition. *See, e.g.,* Kathy Rebello, *Is Microsoft too Powerful?*, BUSINESS WK., Mar. 1, 1993, at 82. It was rumored that the FTC would move for an immediate injunction against Microsoft in its meeting of February 5, 1993. However, the FTC commissioners reached a 2-2 impasse. *See Tie Vote Blocks Move to Enjoin Microsoft Sales Practices*, FTC: WATCH NO. 383, Feb. 8, 1993.

Additional allegations of unfair trade practices against Microsoft have included using knowledge of upcoming OS functions to give its applications a jump on the competition and using undocumented calls in its OS to benefit its applications programs. *See* Thomas McCarroll, *IBM's Unruly Kids*, TIME, Feb. 1, 1993, at 54; *see, e.g.,* ANDREW SCHULMAN, ET AL., UNDOCUMENTED WINDOWS (1992). *See also* O. Casey Carr, *Hi-tech — Microsoft Plays Hardball — Some Question Its Growing Industry Dominance*, SEATTLE TIMES, Apr. 8, 1991, at B1.

69. After the 38-month FTC investigation stalled, the Justice Department's Antitrust Division announced its own inquiry. *See, e.g.,* John Markoff, *Microsoft Confronts its Success*, N.Y. TIMES, Aug. 23, 1993, at C1.

70. The European Community's antitrust authority (Directorate-General IV) is said to be probing Microsoft's business practices as a result of a complaint by Novell. Suzanne Perry-Reuter, *Microsoft Faces Probe in Europe*, WASH. POST, Sept. 7, 1993, at E1.

Finally, successive developments of Intel and Intel-clone micro-processors such as the faster 486s and Pentiums provided IBM-compatibles with considerably more computing power than their Macintosh or Macintosh-derived rivals. If Windows was allowed to succeed, Macintosh application software developers would "port" their successful desktop publishing and graphics manipulation products to Windows, threatening to overwhelm Apple's traditional advantages.

Each of these legal, commercial, and technological issues was and is dramatically important for the future of PC computing and key to the continued dominant influence of Microsoft. The concurrent Windows litigation served to raise the stakes for each of them.

III. AN INTRODUCTION OF COPYRIGHT LAW

Copyright law protects computer software in much the same way as it extends to other forms of expression.[71] Copyright infringement is established when the plaintiff proves existence, ownership, and validity of the copyright, as well as copying by the defendant.[72] In the absence of direct evidence, copying may be established with circumstantial evidence. Typically, this situation will involve proving that the defendant had access to the plaintiff's copyrighted work[73] and showing a "substantial similarity" between the two works.[74]

The defendant bears the burden of proving the invalidity of a registered copyright.[75] A copyright is not valid if it

71. 17 U.S.C. § 101 (1993). For an excellent primer on copyright protection of computer software see Gates Rubber Co. v. Bardo Chemical Industries, Ltd., 9 F.3d 823, 831-46 (10th Cir. 1993).

72. 17 U.S.C. §§ 101 *et seq. See, e.g.,* Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157, 1162 (9th Cir. 1977); *see also* NIMMER, *supra* note 14, at ¶ 1.03[3].

73. For example, buying the copyrighted work. *See* Spectravest, Inc. v. Mervyn's, Inc., 673 F. Supp. 1486, 1491 (N.D. Cal. 1987).

74. *See, e.g., Sid & Marty Krofft Television Prods., Inc.*, 562 F.2d at 1162.

75. *See, e.g.,* Tonka Corp. v. Tsaisun, Inc., No. Civ. 3-85-1885, 1986 WL 29980, at *2 (D. Minn. 1986); Broadcast Music, Inc. v. Moor-Law, Inc., 484 F. Supp. 357, 363 (D. Del. 1980).

Copyright registration is not a prerequisite to copyright protection, 17 U.S.C. § 408, which inures to the author at the moment the work is created. 17 U.S.C.

lacks an element of originality. However, the requirement of originality should not be overstated. According to the Eleventh Circuit Court of Appeals:

> Although the originality concept defies exact definition, courts generally agree that "originality" for copyright purposes is something less than the novelty or uniqueness necessary for patent protection. The test of originality variously has been characterized as "modest," "minimal," and "a low threshold" . . . . All that is needed . . . is that the "author" contributed more than a "merely trivial" variation, something recognizably "his own." Originality in this context "means little more than a prohibition of actual copying." No matter how poor artistically the "author's" addition, it is enough if it be his own.[76]

The presumption of originality provided by registration may be rebutted with evidence that the copyrighted work itself was copied from another work.[77]

Other than originality, there are other requirements for copyrightability or protectibility. For example, copyright protection is not extended to ideas, only the expression of ideas.[78] In cases where the idea and the expression of the idea are inseparable, the so-called merger doctrine applies to deny protection in the absence of duplication.[79] Similarly, if the number of ways to express an idea is ex-

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§ 102(a). However, to protect her copyright, an author must attach a copyright notice. 17 U.S.C. § 401. Registration operates as a prerequisite to some crucial aspects of an infringement suit. *See, e.g.,* 17 U.S.C. §§ 411(a), 412; Bull HN Information Systems, Inc. v. American Express Bank Ltd., No. 88 (CIV. 2103 SWK), 1990 WL 48098 (S.D.N.Y. 1990) (no infringement action absent valid registration). *See, e.g.,* NIMMER, *supra* note 14, at ¶ 1.20-.22.

76. Original Appalachian Artworks, Inc. v. Toy Loft, 684 F.2d 821, 824 (11th Cir. 1982) (citations omitted).

77. *Id.* at 825.

78. *See, e.g.,* 17 U.S.C. § 102(b). "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work." In other words, copying only extends to "copying of the expression of an idea rather than just the idea itself." Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157, 1163 (9th Cir. 1977); *see also* Harper & Row Publishers, Inc. v. Nation Enterprises, 471 U.S. 539 (1985); Mazer v. Stein, 347 U.S. 201, 217-18 (1954).

79. Herbert Rosenthal Jewelry Corp. v. Honora Jewelry Co., Inc., 509 F.2d 64, 65 (2d Cir. 1974).

tremely limited, the expression will not be copyrightable[80] because that would confer a monopoly of the idea on the copyright owner.[81] For the same reason, scénes á faire (stock or practically indispensable items) are given very little protection.[82]

In computer software cases the idea-expression dichotomy and other aspects of unprotectibility have become hopelessly intermingled with the "substantial similarity" inquiry.[83] Into this confusion has stepped "look and feel,"[84] at which point two different principles have served to further obfuscate the issue. First, it seems correct that copyright protection may extend to non-literal aspects,[85] or the "total concept and feel" of a work. Second, "[c]opyrightable expression may be found in the arrangement of elements that individually are not subject to copyright protection."[86] The key to this apparent dichotomy is that, where the plaintiff is arguing protection of the "total concept and feel" yet the discrete elements that make up

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80. *See, e.g.,* Morrissey v. Procter & Gamble, Co., 379 F.2d 675, 678-79 (1st Cir. 1967):

> When the uncopyrightable subject matter is very narrow, so that "the topic necessarily requires" if not only one form of expression, at best only a limited number, to permit copyrighting would mean that a party or parties, by copyrighting a mere handful of forms, could exhaust all possibilities of future use of the substance. In such circumstances it does not seem accurate to say that any particular form of expression comes from the subject matter. However, it is necessary to say that the subject matter would be appropriated by permitting the copyrighting of its expression. We cannot recognize copyright as a game of chess in which the public can be checkmated.

81. *Herbert Rosenthal Jewelry Corp.*, 509 F.2d at 65.

82. Atari, Inc. v. North Am. Philips Consumer Elecs. Corp., 672 F.2d 607, 616 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982); Walker v. Time Life Films, Inc., 615 F. Supp. 430, 435 (S.D.N.Y. 1985), *aff'd*, 784 F.2d 44 (2d Cir.), *cert. denied*, 476 U.S. 1159 (1986). *See also* American Direct Mktg., Inc. v. Azad Int'l, Inc., 783 F. Supp. 84, 95 (E.D.N.Y. 1992) ("Material or themes commonly repeated in a certain genre are not protectible by copyright").

83. *See infra* text accompanying note 233.

84. *Cf.* Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37, 63 (D. Mass. 1990). *See infra* text accompanying note 213.

85. *See, e.g.,* Roulo v. Russ Berrie & Co., Inc., 886 F.2d 931 (7th Cir. 1989), *cert. denied*, 493 U.S. 1075 (1990); Reader's Digest Ass'n, Inc. v. Conservative Digest, Inc., 821 F.2d 800 (D.C. Cir. 1987); Roth Greeting Cards v. United Card Co., 429 F.2d 1106 (9th Cir. 1970). *See infra* note 239.

86. Branch v. Ogilvy & Mather, Inc., No. 89 CIV 2440 LLS, 1990 WL 74540, at *7 (S.D.N.Y. 1990).

that gestalt are not *individually* copyrightable, then only verbatim (virtually identical or literal) copying is barred.[87] As will be seen, it is arguable that in the Windows litigation, Apple in effect was advocating a substantial similarity approach to protecting its interface, notwithstanding that it was composed of unprotectible elements.

Although there is broad acceptance of these principles of copyright law, different circuits have evolved very different practical approaches.[88] For example, the Court of Appeals for the Ninth Circuit, which will hear any appeal of the Windows case, has developed a bifurcated test for "substantial similarity" involving both extrinsic and intrinsic stages.[89] The Ninth Circuit also has endorsed the technique of what is known as "analytic dissection" in determining copyrightability.

Importantly, in the context of the Windows litigation, analytic dissection is appropriate for the first, extrinsic part of the test, and it often may be a judge-made determination. Indeed, dissection may be performed to determine whether similarities result from unprotectible expression.[90] According to the Ninth Circuit, however, dissection is inappropriate when it comes to the intrinsic stage which will typically be a jury-made decision.[91] That second stage "does not depend on some hypercritical scrutiny of the works. It depends on the response of the ordinary reasonable person."[92]

It bears reiterating that, while substantial similarity is the basic test for copying under both parts of the bifurcated test, near or virtual identity is required in cases where there

87. *See, e.g.,* Rachel v. Banana Republic, Inc., 831 F.2d 1503, 1507 (9th Cir. 1987).

88. *See, e.g.,* Autoskill, Inc. v. National Educ. Support Sys., Inc., 994 F.2d 1476, 1490 n.17 (10th Cir.), *cert. denied*, 113 S. Ct. 307 (1993).

89. *See infra* text accompanying note 269.

90. Data East USA, Inc. v. Epyx, Inc. 862 F.2d 204, 208 (9th Cir. 1988); Aliotti v. R. Dakin & Co., 831 F.2d 898, 900 (9th Cir. 1987). *See also* Telemarketing Resources v. Symantec Corp., No. C88-20352-RPA, 1989 WL 200350, at *4 (N.D. Cal. 1989).

91. *Aliotti*, 831 F.2d at 900.

92. JBJ Fabrics, Inc. v. Mark Indus., Inc., No. CV 86-4881 FFF, 1987 WL 47381, at *3 (C.D. Cal. 1987).

is a merger of the idea and its expression.[93] Near or virtual identity is also required where there are only a limited number of ways to express the idea[94] as in all cases of unprotectibility.

Finally, modern copyright law must be interpreted in the light of the Supreme Court's unanimous decision in *Feist Publications, Inc. v. Rural Telephone Service Company, Inc.*[95] *Feist* concerned a claim of copyright infringement involving telephone white pages. The issue revolved around the disparate treatment copyright law affords to facts and factual compilations.[96] However, in the course of the Court's opinion, Justice O'Connor made several generalized statements about the role and doctrine of copyright law that may influence the determination of computer software and, *a fortiori* interface cases. For example, the Justice stressed the requirement of creativity with the statement, "[a]s a constitutional matter, copyright protects only those constituent elements of a work that possess more than a de minimis quantum of creativity . . . . [C]opyright rewards originality, not effort."[97]

> [T]he 1976 revisions to the Copyright Act leave no doubt that originality, not "sweat of the brow," is the touchstone of copyright protection in directories and other fact-based works . . . . The revisions explain with painstaking clarity that copyright requires originality; that facts are never original; that the copyright in a compilation does not extend to the facts it contains; and that

93. Herbert Rosenthal Jewelry Corp. v. Honora Jewelry Co., 509 F.2d 64, 65 (2d Cir. 1974); *see also* Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157, 1168 (9th Cir. 1977) ("When idea and expression coincide, there will be protection against nothing other than identical copying of the work").

94. *See, e.g.*, Frybarger v. International Business Mach., Inc., 812 F.2d 525, 529-30 (9th Cir. 1987).

95. 111 S. Ct. 1282 (1991). Justice O'Connor delivered the opinion of the court which was joined by seven justices. Justice Blackmun concurred without opinion.

96. *Id.* at 1287-90. The court resolved that tension as follows:

> Copyright treats facts and factual compilations in a wholly consistent manner. Facts, whether alone or as part of a compilation, are not original and therefore may not be copyrighted. A factual compilation is eligible for copyright if it features an original selection or arrangement of facts, but the copyright is limited to the particular selection or arrangement. In no event may copyright extend to the facts themselves.

Id. at 1290.

97. *Id.* at 1297.

> a compilation is copyrightable only to the extent that it features an original selection, coordination, or arrangement.[98]

The *Feist* court's observations on mere compilations must be considered by any software developer seeking to synthesize existing aspects of an interface.

IV. LITIGATING THE WINDOWS INTERFACE

In March 1988, Apple Corporation filed suit against Microsoft Corporation and Hewlett-Packard claiming that Microsoft's Windows version 2.03 and Hewlett-Packard's New Wave[99] environments infringed Apple's copyrights on the presentation and control of screen information.[100] Specifically, Apple maintained that there were 189 "similarities in particular features" between the Macintosh display and Windows.[101] In essence, however, Apple was claiming that Microsoft had appropriated the "look and feel" of the Macintosh.

A. The Impact of the 1985 License Agreement

A week after suit was filed Apple and Microsoft made public their previously secret 1985 agreement.[102] By that

98. *Id.* at 1295 (citations omitted).

99. Microsoft apparently granted a license to Hewlett-Packard to use Windows technology in developing New Wave. Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444, 1447-48 (N.D. Cal. 1991). As Windows "sits" upon DOS, so New Wave sits upon Windows. For a description of New Wave version 3.0, see Peter H. Lewis, *A Program That Harnesses Other Software's Strengths*, N.Y. TIMES, Jun. 17, 1990, § 3, at 8. New Wave makes Windows more object-oriented. However, it has been perceived as little more than a Windows accessory, and outgunned by utilities such as Symantec Corporation's Norton Desktop for Windows. New Wave's future is uncertain given the rumors of a much more object-oriented Windows 4.0 ("Chicago") due for release in 1994. By Spring, 1993, New Wave was in version 4.1.

100. Andrew Pollack, *Apple Sues Microsoft and Hewlett-Packard*, N.Y. TIMES, Mar. 18, 1988, at D3. Specifically, Apple alleged three claims: (1) copyright infringement by Windows 2.03 and New Wave, (2) contributory infringement against Microsoft for licensing the visual displays to Hewlett-Packard, and (3) unfair competition. *See* Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444 (N.D. Cal. 1991). At issue were seven Apple copyrights. *See* Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006, 1015 n.1 (N.D. Cal. 1992).

101. 759 F. Supp. at 1448.

102. Reportedly, the 1985 agreement followed a threat by Microsoft to stop developing products for the Macintosh. Andrew Pollack, *Microsoft's Tactics Questioned by Rivals*, N.Y. TIMES, Mar. 15, 1991, at D1 (referring to Apple chairman

agreement, and in return for acknowledging the Macintosh derivation of the Windows visual display, Apple had granted Microsoft a perpetual and royalty free non-exclusive license "to use these derivative works in present and future software programs."[103] In return, Microsoft granted Apple a more limited cross-license on the displays it had created for Windows, and it agreed to develop business software for the Macintosh.[104]

Microsoft's key initial contention was that the agreement was a complete defense; a license to use Apple's technology to develop future versions of Windows as it pleased.[105] Apple countered that the license was limited to Windows version 1.0, and Windows 2.03 violated its copyright. Microsoft filed a countersuit alleging that Apple had breached the 1985 agreement and had interfered with Microsoft's relationship with other software developers.[106]

John Sculley's book ODYSSEY). In a later interview Bill Gates recalled the issue as follows:

> An Apple lawyer named Jack Brown went up to Microsoft and said some things about whether intellectual property rights were being used the right way. This was before we shipped Windows 1.0. Then I came down and saw John [Sculley]. Apple licensed us some rights, and we reaffirmed our commitment to do certain things for the Macintosh.

John Markoff, *Armistice For Apple and Microsoft*, N.Y. TIMES, July 16, 1992, at D1.

103. Apple Computer, Inc. v. Microsoft Corp., 709 F. Supp. 925, 927 (N.D. Cal. 1989).

104. *Id.* A summary of the agreement appears at Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444 (N.D. Cal. 1991). *See, e.g.*, Lawrence M. Fisher, *Apple and Microsoft Disclose a 1985 Pact*, N.Y. TIMES, Mar. 24, 1988, at D5.

105. *See, e.g.*, Andrew Pollack, *Apple Wins Round in Microsoft Suit*, N.Y. TIMES, Mar. 18, 1989, § 1, at 35; *Microsoft Copyright Ruling*, N.Y. TIMES, Mar. 22, 1989, at D7; Peter H. Lewis, *All's Not Quiet on the Legal Front*, N.Y. TIMES, Mar. 26, 1989, § 3, at 8.

106. *Apple Accused by Microsoft*, N.Y. TIMES, Apr. 11, 1988, at D4. Ironically, the continuing battle between Microsoft and Apple in the "interface war," did not stop them from forming an alliance in the so-called "font wars." In an agreement announced in October 1989, Microsoft and Apple cross-swapped "TrueType" scalable font technology (Apple's) and "Trueimage" font printer driver technology (Microsoft's). *See* Peter H. Lewis, *The Fallout From the Font Wars*, N.Y. TIMES, Oct. 1, 1989, § 3, at 13; *The Microsoft-Apple Standard-Bearer in the Font Wars*, N.Y. TIMES, Mar. 19, 1991, at C6. The other major combatant in the font wars is IBM which has an agreement with Adobe to use the latter's display and printer interfaces. Andrew Pollack, *I.B.M. Will Use Adobe's Technology*, N.Y. TIMES, Mar. 6, 1990, at D24; Peter H. Lewis, *The Font Wars: New Weapons are Rolled Out*, N.Y. TIMES, Mar. 11, 1990, § 3, at 8. For the apparent peace treaty, see Peter H. Lewis, *On the Font Battlefront, An Uneasy Truce Raises Hopes*, N.Y. TIMES, Oct. 14, 1990, § 3, at 8;

However, in *Apple Computer, Inc. v. Microsoft Corp.*, Judge Schwarzer ruled that only the visual displays in Windows 1.0 were the subject matter of the license.[107] In concluding that the programs were significantly different,[108] the court based its decision on the fact that Windows 2.03, the subject of the action, used overlapping windows whereas Windows 1.0, the specific subject of the license, used tiled windows.[109] Given these determinations, it followed that the license could not constitute a complete defense with regard to Windows 2.03 attributes not present in Windows 1.0.

Subsequently, the court dealt with the question whether the 1985 agreement constituted a *partial* defense to the infringement claim,[110] and concluded that the license did cover discrete aspects of the Windows 2.03 display that were found in Windows 1.0.[111] While Apple claimed that there were 189 "similarities in particular features" between the Macintosh display and the defendants' products,[112] Microsoft argued that 178[113] of those features were in-

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see, e.g., Edward Mendelson, *Typefaces Unlimited: 5 Font Managers for Windows 3.0*, PC MAG., Apr. 16, 1991, at 167-201; *see also* Paul Andrews, *Microsoft, Apple Clear the Air*, SEATTLE TIMES, July 15, 1992, at B4 (joint Apple-Microsoft news conference on product plans).

107. Apple Computer, Inc. v. Microsoft Corp., 709 F. Supp. 925, 928-30 (N.D. Cal. 1989).

108. *Id.* at 930-31.

109. Windows 3.0 can display either cascading or tiled windows. MICROSOFT WINDOWS USER'S GUIDE 84-85 (Microsoft 1990).

110. Apple Computer, Inc. v. Microsoft Corp., 717 F. Supp. 1428 (N.D. Cal. 1989).

111. *Id.* at 1430-32. Specifically, the court concluded:

> In its prior ruling the Court concluded that overlapping windows, as featured in Windows 2.03, are a visual display within the meaning of the 1985 Agreement and are not within the scope of the license. But overlapping windows, obviously, are not the only visual display in Windows 2.03. And equally obviously, because Windows 1.0 did not have overlapping windows, it must have had other visual displays or else the license would have been an empty gesture. It must be concluded therefore that the Agreement licenses the use of the visual displays in Windows 1.0 and to that extent provides a partial defense to infringement claims based on the use of such visual displays.

Id. at 1432 (citation omitted).

112. *Id.* at 1433.

113. In its ruling of August 1992, the court summarized this previous motion and determination as involving 179 items covered by the license. Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006, 1016 (1992). Apple alleged 147 similarities

cluded in Windows 1.0.[114] The court's preliminary conclusion was as follows: "This review discloses that both Windows 1.0 and Windows 2.03 have many visual displays that are also found in the Macintosh user interface. It also discloses, however, that most visual displays in Windows 2.03 are also in Windows 1.0 and, therefore, are covered by the 1985 license."[115]

The court proceeded to allocate the features identified by Apple to one of six categories: the appearance of individual main application windows; the design and appearance of dialogue boxes; the design and appearance of menus; the design and appearance of applications programs; icon design, appearance and manipulation, and the representation of multiple main application windows.[116] Of these features, the court ruled that the visual displays employed in Windows 2.03 were essentially the same as those employed in version 1.0 except for the use of overlapping, rather than application windows, and some changes in the appearance, location, and use of icons.[117]

Microsoft next argued that the overlapping windows features which were not present in Windows 1.0[118] nevertheless were covered by the 1985 agreement because they were featured in the displays of the application programs also covered by the agreement.[119] The court accepted Apple's argument that the only application program visual displays covered by the agreement were those generated by

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with New Wave, of which all but 54 were found by the court to be covered by the license. *Id.*

114. 717 F. Supp. at 1433.

115. *Id.*

116. *Id.* at 1433-34.

117. *Id.* at 1434-35. *See, e.g.,* Lawrence M. Fisher, *Ruling Favors Microsoft and Hewlett*, N.Y. TIMES, July 22, 1989, § 1, at 31; *Microsoft Case Ruling*, N.Y. TIMES, July 27, 1989, at D3.

118. Identified in the case as items A1, A8, B1, B2, D1, D2, and D3, the list included such classic windowing features as the top window in an overlapping stack being displayed as active (B1), a window being moved to the top of a stack when clicked (B2), and dragging windows (D1). *See* Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444 (N.D. Cal. 1991).

119. Apple had argued that five Microsoft applications programs developed for the Macintosh, including Word and Excel, infringed its copyrights. Thus, the 1985 agreement was worded to include not only the visual displays in Windows 1.0 but also those in the application programs.

the application programs themselves. Since the visual displays in dispute were generated not by the applications but as a result of calls made to the Macintosh operating system, the resulting displays were not covered by the agreement.[120]

At a later stage, Apple moved to have the license struck down on the basis of fraud and coercion, possibly because it was aware that the way the license agreement's dissection of the Macintosh interface was adversely affecting its case.[121] On that point, the court ruled against Apple.[122]

B. Protectibility and Infringement

With the 1985 agreement failing to provide a total defense, the dominant question in the Windows litigation became whether the remaining visual display features not covered by the license infringed Apple's copyrights. That question involved the frequently overlapping issues of protectibility (or validity) and substantial similarity.[123] In its March 1991 ruling the court dealt with two issues regarding the protectibility of Apple's copyrights.

First, Hewlett-Packard challenged the validity of the registered copyrights on the basis of fraud on the copyright office; specifically, Apple's failure to disclose the intellectual debt owed to the Xerox-developed interfaces of the 1970s.[124] Judge Walker,[125] who by now had taken over the

120. Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444 (N.D. Cal. 1991). What Microsoft received in the 1985 Agreement was the right to continue to market its application programs written for the Macintosh and to use the visual displays generated by those application programs (not the visual displays generated by calls by the application programs to the Macintosh operating system) in present and future programs.

121. AP, June 13, 1991.

122. Judge Walker described Apple's argument as a "sideshow," characterizing Apple's late discovery of the issue as "pretty outlandish." AP, June 13, 1991.

123. Microsoft's affirmative defenses include challenges to the validity of the Apple copyrights on the basis that the visual displays were merely functional, not original and were common and ordinary expressions of unprotectible ideas. 759 F. Supp. at 1453 n.12.

124. *Id.* at 1454. This is similar to the issue which arose in the Ashton-Tate litigation over dBASE, its leading database software. Therein, the trial judge ruled that the plaintiff had knowingly and with an intent to deceive failed to disclose that its program was derived from a public domain program developed by the Jet Propulsion Laboratory in Pasadena, California. Ashton-Tate Corp. v. Fox Software, Inc.,

Windows litigation from Judge Schwarzer,[126] had decided the earlier case of *Xerox Corporation v. Apple Computer, Inc.*[127] In *Xerox* the plaintiffs' application for a declaration that the Macintosh interface was derived from the copyrighted Star had failed.[128] Judge Walker's view of the Windows case was consistent with that opinion, and he granted Apple's motion for partial summary judgment against Hewlett-Packard which had failed to establish a triable issue on the invalidity of Apple's copyrights.[129]

Microsoft and Hewlett-Packard also attacked the Apple copyrights on the basis of lack of originality. On this issue the court reached the following conclusion:

> [A]lthough there is evidence that Apple's designers borrowed ideas from Xerox's Smalltalk and Star programs, there is no substantiation for the allegation that Apple copied protectible elements of expression from those programs. Indeed, photocopies of visual displays from the Smalltalk and Star programs within the par-

760 F. Supp. 831 (C.D. Cal. 1990); *see, e.g.,* Don J. DeBenedictis, *Critics Say Judge Misapplied Patent Law in Dismissing Software Maker's Suit*, 77 ABA J. 30 (Mar. 1991); PC WORLD, Apr. 1991, at 68. Subsequently, Ashton-Tate's motion to reconsider was decided in Ashton-Tate's favor. 760 F. Supp. at 831. The Ashton-Tate/Fox litigation was resolved as part of the Justice Department's scrutiny of the acquisition of Ashton-Tate by Borland. United States v. Borland Int'l, Inc., et al.; Proposed Final Judgment and Competitive Impact Statement, 56 Fed. Reg. 56096 (1991); *see also Software Merger Complaint Settled: Royalty Free Licensing Scheme Adopted*, FTC: WATCH No. 353 (October 21, 1991). Shortly thereafter Fox Software, Inc., was acquired by Microsoft. Lawrence M. Fisher, *Borland to Acquire a Rival*, N.Y. TIMES, July 11, 1991, at D1.

125. For a profile of Judge Walker, see Heather Clancy, *Judge Vaughn Richard Walker*, COMPUTER RESELLER NEWS, Oct. 21, 1991, at 166.

126. Judge Schwarzer took a five-year leave of absence from the bench to head the Federal Judicial Center. Don Clark, *Apple Case Gets Another New Judge*, N.Y. TIMES, Feb. 7, 1990, at C1.

127. 734 F. Supp. 1542 (N.D. Cal. 1990). *See, e.g.,* Andrew Pollack, *Most of Xerox's Suit Against Apple Barred*, N.Y. TIMES, Mar. 24, 1990, § 1, at 31.

128. Note that Xerox did not allege that Lisa and Macintosh had been *copied* from Star. *See* Xerox Corp. v. Apple Computer, Inc., 734 F. Supp. 1542, 1552 n.17 (N.D. Cal. 1990).

129. Hewlett-Packard had established that Apple was "influenced" by Smalltalk and Star, but nothing further, and it had failed to offer evidence of the necessary intent to deceive the copyright office. Hewlett-Packard failed in its allegation that the visual displays were derivative works in the absence of evidence of substantial copying. Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444, 1454-55 (N.D. Cal. 1991).

> ties' exhibits reveal scant similarity of expression between Xerox's and Apple's visual displays.[130]

At this point in the litigation, Apple appeared to have the upper hand. Indeed, Apple was clearly on the offensive, amending its complaint to include Windows 3.0 and challenging the validity of the 1985 license agreement.[131] Less spectacularly, however, Microsoft and Hewlett-Packard moved for reconsideration of the issue of copyrightability.

In August 1991, in what was the turning point in the Windows litigation, the court granted the defense motion, stating that "lack of original expression of a component element shall be relevant to the scope of protection and substantial similarity analyses."[132] Although he opened the door to the question of copyrightability, Judge Walker minimized defense expectations by appending his views on the issue of originality.

> If a plaintiff directly copied the expressive elements of his work from preexisting works, he has no right to preclude others from using those same "unoriginal" elements. The defendant may not, of course, take any original expressive elements from plaintiff's work and use them in a substantially similar manner simply because plaintiff used "unoriginal" elements and this remains true even if all but one of the expressive elements of plaintiff's work are unoriginal. The addition of even one original expressive element may so alter a work otherwise wholly comprised of unoriginal elements that copyright protection is appropriate . . . .
>
> Defendants must show that the component features of Apple's works which are allegedly "unoriginal" have been directly copied from prior works. In other words, *if Apple's expression of those component features is different from the expression of similar features in preexisting programs, then defendants have failed to establish that Apple's expression is "unoriginal."*[133]

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130. *Id.* at 1455. For a less than flattering critique of Judge Walker's ruling, see William Zachman, *Latest Apple Ruling Muddies Already Murky Water*, PC WK., Mar. 18, 1991, at 66.

131. *See supra* text accompanying note 121.

132. 779 F. Supp. at 135.

133. *Id.* at 134-35 (emphasis added).

Indeed, Judge Walker characterized the defense strategy as seeking "to use lack of originality of constituent elements as a means of eliminating those elements from the substantial similarity of expression analysis."[134] As a result Judge Walker offered his thoughts on that very issue of "dissecting" the Apple interface, a recurring theme in defense motions and arguments.[135] At this stage, Judge Walker first addressed the dynamically interconnected concepts of dissection, copyrightability (protectibility), and "substantial similarity" (or infringement), as follows:

> Some dissection of elements and the application of merger, functionality, scénes á faire, and unoriginality theories are necessary to determine which elements can be used freely by the public in creating new works, so long as those works do not incorporate the same selection or arrangement as that of the plaintiff's work. Because there ought to be copyright protection for an innovative melding of elements from preexisting works, elements which have been deemed "unprotectible" should not be eliminated prior to the substantial similarity of expression analysis. Suppose defendant copied plaintiff's abstract painting composed entirely of geometric forms arranged in an original pattern. The alleged infringer could argue that each expressive element (i.e., the geometric forms) is unprotectible under the functionality, merger, scénes á faire, and unoriginality theories and, thus, all elements should be excluded prior to the substantial similarity of expression analysis. Then, there would be nothing left for purposes of determining substantial similarity of expression. In this example, elimination of "unprotectible" elements would result in a finding of no copyright infringement, which would be clearly inconsistent with the copyright law's purpose of providing incentives to authors of original works.
>
> Accordingly, the court concludes that even if elements are found "unprotectible," they should not be

134. *Id.* at 134.

135. However, as Judge Walker noted, "[a]lthough HP contends that it is not urging the court to dissect features of Apple's works to such a trivial degree, the parties offer no comprehensible standard to ascertain how close a dissection is required to implement the copyright laws." *Id.* at 135.

> eliminated from the substantial similarity of expression analysis. Instead, if it is determined that the defendant used the unprotectible elements in an arrangement which is not substantially similar to the plaintiff's work, then no copyright infringement can be found. If, on the other hand, the works are deemed substantially similar, then copyright infringement will be established even though the copyrighted work is composed of unprotectible elements. There is simply no other logical way of protecting an innovative arrangement or "look and feel" of certain works.[136]

Thus, dissection and a determination of unprotectibility of individual components or features, although dispositive of infringement claims regarding those discrete features, might not preclude an overall "substantial similarity" analysis of the whole interface.[137]

Nevertheless, this statement by the judge does hint at what was becoming the major impediment to Apple's case, namely an unwillingness to address infringement prior to addressing copyrightability. Judge Walker structured hearings on defense motions to deal first with copyrightable issues and then similarity issues.[138] This action was consistent with earlier rulings by both Judge Walker and Judge

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136. *Id.* at 134-35.

137. Judge Walker dealt with the "look and feel" issue in much the same way as Judge Schwarzer who had preceded him.

> Implicit in Judge Schwarzer's approach to the case is a rejection of Apple's fundamental contention that the "total concept and feel" of the Macintosh graphic user interface is protectible expression. Rather, Judge Schwarzer's approach appears to have been to exclude licensed visual displays prior to applying the substantial similarity of idea and expression tests. The undersigned has considered a different approach to the litigation from that adopted by Judge Schwarzer, one that would not begin by an attempt to parse the visual displays of the Macintosh system software. However appealing such an approach might seem in the abstract, the 1985 Agreement appears to license individual visual displays rather than an overall "total concept and feel."

Apple Computer, Inc. v. Microsoft Corp., 759 F. Supp. 1444, 1449 (N.D. Cal. 1991); Andrew Pollack, *Judge Favors Apple Stand on Copyright*, N.Y. TIMES, Mar. 7, 1991, at D5. This approach subsequently was restated at Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006, 1025 (N.D. Cal. 1992). *See, e.g.*, Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37, 62-63 (D. Mass. 1990); Ashton-Tate Corp. v. Ross, 916 F.2d 516, 520-22 (9th Cir. 1990).

138. Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006, 1016 (N.D. Cal. 1992).

Schwarzer that the question of copyright infringement would be addressed on a function-by-function basis, not by reference to the overall "look and feel" of the interfaces. Apple effectively ignored this structure. As Judge Walker later related:

> Apple refused to join the issues raised in defendants' motions. Apple contended that its own lists of similarities are not exact descriptions of any infringing features, but merely examples of the overall similarity of defendants' works. Sticking stubbornly to a "look and feel" or "gestalt" theory of this lawsuit, Apple was apparently of the belief that these passwords would automatically get its case around summary judgment motions and to a jury, regardless whether any of the visual displays that potentially comprise this "look and feel" are themselves protectible expression.[139]

At this time Judge Walker, who had been less than enthralled by the video evidence presented to him, requested copies of the disputed programs installed on computers to be made available to the court. Subsequently, the parties gave the judge and his staff tutorials on the equipment.[140] Hands-on experience by the court must have been responsible partially for the far more detailed and technologically insightful rulings that followed.

Legal and commercial analysis now merged as it became apparent that by concentrating solely on "look and feel" Apple was seeking to protect the desktop metaphor.[141] It was this approach that led the court to complete, unopposed, the effective dismemberment of Apple's case with its rulings of April 14, 1992.[142] At that time the ten remaining features that had been determined as falling outside the 1985 license were held to be not protectible, either because of merger of idea with expression,[143] as

139. *Id.* at 1016.

140. *Id.* at 1017 n.3.

141. *Id.* at 1022-26.

142. Summarized at Apple Computer, Inc. v. Microsoft Corp., No. C-88-20149 VRW, 1992 WL 75423 (N.D. Cal. Apr. 14, 1992). For some of the expert testimony in support of the motions decided at this time, see Jon Swartz, *Microsoft-Apple Battle Building Toward Climax: Expert Testimony Key to Pretrial Motions*, MACWEEK, Feb. 24, 1992, at 95.

143. *Apple Computer*, 1992 WL 75423 at *1, ¶(1)(a).

scénes á faire,[144] or because of a limited number of ways to express the idea.[145] A similar result was reached in the case of Hewlett-Packard.[146] At the same time Judge Walker dismissed Apple's allegations of copyright infringement against Windows 3.0[147] on the basis that alleged similarities were already covered by the 1985 license in the same manner as 2.03.[148] Judge Walker set the stage for the final determination of the case when he stated as follows:

> If the Windows 1.0 "look and feel" when supplemented with unprotectible expression leads naturally to the look and feel of the works in question, there is no infringement. If, however, the as yet-unspecified "look and feel" of the Apple works is not the necessary result of the grafting of the unprotectible elements onto the licensed "look and feel" of Windows 1.0, infringement may be shown.[149]

Shortly after these April motions were decided, Apple began a new marketing campaign for the Macintosh pointing out how *different* it was from Windows.[150] In July 1992, the chairmen of Apple and Microsoft met to formally announce their continued cooperation and cross-platform de-

144. *Id.* at *1, ¶(1)(b).

145. *Id.* at *1, ¶(1)(c).

146. *Id.* at *1, ¶¶ (3)-(5) (holding 53 of 54 features were subject to little or no copyright protection).

147. Apple announced its intention to amend its complaint to include Windows 3.0 and New Wave 3.0 in April 1991. Lawrence M. Fisher, *Gains Shown By Microsoft Despite Slump for Industry*, N.Y. TIMES, Apr. 17, 1991, at D3. It did so by filing a supplemental complaint on June 28, 1991. *See* Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006, 1016 (N.D. Cal. 1992).

148. *Apple Computer, Inc.* 1992 WL 75423, at *2; *see also* 799 F. Supp. at 1017 n.4.

149. 1992 WL 75423.

150. "There's a big difference between a computer screen that looks like a Macintosh and a computer that performs like a Macintosh." *See* Lawrence M. Fisher, *Apple Finds A New Arena For Its Fight With Microsoft*, N.Y. TIMES, June 16, 1992 at D1. Another advertising campaign in 1993 was based around the theme "Apple put their brightest engineers to work in a room with no Windows. And look what they did. They made it easier to own a color Macintosh. . . . They made it easier to own a really powerful Macintosh . . . . They made it easier to do what you couldn't do before. . . . They made it harder to buy a computer with Windows." Apple Advertising Supplement, PC WK., Mar. 8, 1993.

velopment.[151] However, the parties stopped short of bringing the litigation to a close.

The April 1992 ruling was expressed in a short memorandum. In large part on motions to reconsider those rulings,[152] Judge Walker rendered his most comprehensive opinion in August 1992.[153] Although not finally dispositive of all the issues in the litigation, and subject to appeal, this was the crucial decision in the Apple-Microsoft litigation.

1. The Dissected Features

By this stage in the proceedings, the court had identified the five basic features of a graphical user interface as Overlapping windows, Iconic representation, Object opening/closing, Menus, and Iconic manipulation.

Notwithstanding its prior concentration on an exclusively "look and feel" approach, Apple ultimately did join battle on the more dissected view of things that had dominated Microsoft's approach, and had won over both judges who had presided over the litigation. Apple's change of heart was presented by a motion for reconsideration of Judge Walker's April 14, 1992 grant of Microsoft's motion for partial summary judgment.[154] Those proceedings had dealt with the final ten features not covered by the 1985 license.[155] These features were known as items A1, A8, B1, B2, D1-D3, G4-G6 from the parties' original list.[156] Features A1, A8, B1, B2, and D1-D3 went to the Macintosh

151. Paul Andrews, *Microsoft, Apple Clear the Air on Product Teamwork*, SEATTLE TIMES, July 16, 1992, at D8. In a joint interview with Bill Gates, Apple Chairman John Sculley commented, "Judge Walker substantially limited the claims that Apple had, and we filed a motion for reconsideration. From a practical standpoint, we never ran our business on the assumption that we were going to win, so life goes on." John Markoff, *Armistice for Apple and Microsoft*, N.Y. TIMES, July 16, 1992, at D1.

152. Apparently, Judge Walker considered refusing the motion for rehearing, considering the application to have been tardy. James Daly, *Judge to Rethink Apple Case in Copyright Battle*, COMPUTERWORLD, May 18, 1992, at 24.

153. Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006 (N.D. Cal. 1992).

154. *See supra* text accompanying note 142.

155. Different features were at issue in the Hewlett-Packard case.

156. *See supra* text accompanying note 110.

window displays. Features G5 and G6 went to iconic representation. Feature G4 implicated icon manipulation.

Upon the motion for reconsideration as to whether these features constituted protectible expression, the same copyright doctrines of merger of idea with expression, scénes á faire, and limited number of ways to express the idea were discussed. Judge Walker described the function of these various copyright doctrines as follows:

> Certain features of artistic works are so common, or so obvious, that they require virtually no creative effort to conjure and thus do not depend on the revenue effect of copyright protection. The concepts of ideas, scénes á faire, and lack of originality fall into this category of limiting doctrines. On the other hand, placing some features of artistic works in the exclusive domain of one author would so raise the costs of creation for others as to impede the progress of the arts. This accounts for the doctrines of merger, limited number of ways, and functionality. To apply these doctrines, courts must analytically dissect the works of an author seeking copyright protection to determine the metes and bounds of his property interest in the works. The features of works that are covered by these limiting doctrines are protected only from virtually identical copying, for this is the province of the ultimate free-rider, who makes a zero investment in creativity.[157]

Judge Walker subscribed to the Ninth Circuit's two-part test for breach of copyright.[158] "First, the 'ideas' of the works in suit are compared for substantial similarity, using an 'extrinsic test' or 'objective analysis of expression' . . . . If the ideas are substantially similar, then an 'intrinsic test' or 'subjective analysis of expression' is used."[159] Because the defendants were arguing limiting doctrines such as scénes á faire, circuit precedent also required that the Windows features should be "virtually identical" copies of Macintosh features for summary judgment to be refused.[160]

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157. 799 F. Supp. at 1022.

158. *See supra* text accompanying note 89 and *infra* text accompanying note 267.

159. 799 F. Supp. at 1020 (citations omitted).

160. *Id.* at 1027, 1043; *see supra* text accompanying note 89; *see also*, M.A. EPSTEIN, MODERN INTELLECTUAL PROPERTY 390-93 (2d ed. 1989).

The key issue remained the change in Windows 2.03 from the tiled windows used in Windows 1.0 to the overlapping windows used by the Macintosh (known as similarity "A1"). Clearly there was an important *visual* difference between overlapping and tiling.[161] For Judge Walker, however, this difference was a function of technology not expression.

> The advent of overlapping windows in computer interfaces was largely the product of the operating memory capacity of computers outpacing the capacity of monitor screens to display all the information the computer was able to generate. The computer memory's ability to handle greater amounts of information and even at times simultaneously to run more than one application program gave rise to the need to accommodate resultingly complex visual images on the limited two-dimensional surface available on a computer screen.[162]

Available video technology allowed only two possible solutions, either switch between screens or split a single screen into multiple, virtual screens or windows. The Macintosh's overlapping windows may have looked different, but "the means of expression of multiple images are limited to splitting the screen or switching the images."[163] According to the court:

> Because a programmer must choose between switching images or splitting the screen, the means of expression are limited, and merger applies at least to the basic arrangements claimed in similarity A1 . . . .
>
> In any event, the Macintosh interface at most combines a possibly unlicensed switching technique, the only other means of expression, to that plainly licensed,

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161. The court stated:

> [T]he overlapping windows of the Macintosh are considerably more versatile and aesthetically pleasing than the tiled windows of Windows 1.0 because the tiled windows extend in a cumbersome fashion completely along one axis or the other, making either width or height uniform. Moreover, in a tiled window system, the windows must shrink as more and more of them are added to the screen whereas the ability freely to re-size windows in the Macintosh interface without affecting the size of others allows the user to size them in relation to the data they contain or for any other reason.

799 F. Supp. at 1030.

162. *Id.* at 1028.

163. *Id.* at 1030.

> splitting. Accordingly, the scénes á faire doctrine ought also to apply. Finally, use of overlapping windows in the Xerox, Lilith, and Perq systems in the early 1980s shows beyond question that this concept is not original to Apple.[164]

A similar fate awaited Apple's other claims regarding the protectibility of aspects of the Macintosh's windowing. The court held that displaying a window partly on and partly off the screen (A8), making the top-most window active (B1), and clicking a window to bring it to the top of a stack (B2) were standard industry features, functions of switching or splitting screens, and unprotectible under merger and scénes á faire doctrines.[165] The way that a Macintosh window was moved in greyed outline form until released (D1, D2) and the manner in which it rewrote the screen thereafter were unprotectible for the same reasons.[166]

Regarding the iconic representation issues, the limits of the technology made for good scénes á faire and limited methods of expression arguments (items G5, G6, and the duplicative G14). Apple's remaining complaints regarding icons were directed at Hewlett-Packard, specifically the use of file folder, pages with turned-down corners, different designs to designate different object types, and a trash can. Again, principles regarding lack of originality and unprotectibility dominated the court's findings against Apple. Few characteristics escaped summary judgment.[167]

Apple's surviving allegations regarding object opening and closing as well as menu design and layout were also aimed only at New Wave. The only protectible items which raised triable issues concerned some graphical representations indicating the status of an icon expanding into or contracting from a window.[168]

Finally, Apple's failing allegations regarding iconic manipulation primarily implicated New Wave as far as detailed

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164. *Id.* at 1031.
165. *Id.* at 1031-33.
166. *Id.* at 1033-34.
167. *Id.* at 1034-36.
168. *Id.* at 1036-39.

issues regarding the movement and indications of selection or movement.[169] However, Microsoft was implicated by Apple's primary breach of copyright allegation, which consisted of copying the Macintosh feature of moving an icon by clicking and dragging (G4). This feature was again held to be unprotectible under merger and scénes á faire.[170]

Thus, the combination of the 1985 license agreement and circuit precedent's reliance on the use of dissection as to copyrightability as well as the application of a summary judgment-appropriate extrinsic analysis as to substantial similarity, led Judge Walker to conclude that the *individual* elements that made up the Lisa-Macintosh interface were either not protectible or Windows 2.03 features were not substantially similar. Apple's only remaining arguments were twofold. First, Apple could argue that the entire Lisa-Macintosh interface was protectible, notwithstanding such elemental unprotectibility; thus summary judgment was inappropriate under an extrinsic substantial similarity test. Victory in this instance would enable Apple to expose Microsoft to the dangers inherent in a *subjective* intrinsic jury determination of the similarity between the two interfaces. Apple's second possible arguement, which was a poor argument, stated that infringement had occurred on the basis of the virtual identity (literal copying) of some original, unlicensed, unprotectible elements.

The court considered the alleged additional similarities between the Macintosh GUI and Windows 3.0. As Judge Walker noted in another context Windows 3.0 was "the first DOS-based windowing program to begin to rival the graphical capability of the Macintosh."[171] Not only did the imminent launch of version 3.0 trigger Apple's lawsuit, but its release led to the popular view that "Windows makes a PC work like a Mac." The most important changes to the Windows interface in version 3.0 were the replacement of version 2.03's text-based filing system with two graphical features, Program Manager and File Manager. Program Manager acts as the default Shell in which objects and

169. *Id.* at 1039-41.
170. *Id.* at 1039.
171. *Id.* at 1025.

groups of objects are created or manipulated. File Manager functions much like a DOS utility, facilitating file and directory management, including copying and moving files, creating directories, and formatting disks.[172]

The alleged additional similarities in version 3.0 were all ruled to be either duplicative of claims regarding 2.03, unprotectible, lacking in originality, or failing the virtual identity test. The court summarized as follows:

> Not one of the identifiable alleged "additional similarities" comes close to being an identical copy of the corresponding features in the Apple works. Since each and every one of them is subject to at least one limiting doctrine, not one of these items can by itself be the basis of an infringement determination.[173]

2. The Rejection of "Look and Feel"

After the dissection began, first with the licensing issues and then with the Ninth Circuit's extrinsic test, Apple's chances of victory were dramatically reduced. The plaintiff's steadfast insistence on a "look and feel"[174] approach was therefore no idle gesture, but the maintenance of the only winning posture. Although Judge Walker and his predecessor, Judge Schwarzer, had indicated that a "look and feel" approach was less than suitable for this case,[175] it was not until the ruling of August, 1992 that the court dealt with the issue at length.[176]

Apple identified several general aspects of the Macintosh (nee Lisa) GUI that made up the computer's electronic desktop. What Apple apparently wanted referenced

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172. Ironically, it is this separation of File Manager from Program Manager that makes Windows so *unlike* a Macintosh. Windows only approaches Macintosh ease of use when used with an integrated shell such as those shipped with Norton Desktop for Windows 2.x and PC Tools for Windows 1.0. Even then Windows 3.x only simulates some processes built into the Macintosh. For example, the Macintosh structure of the file folder *is* your directory structure not a metaphor, and file icons are created automatically when you open a new file. *See* Kevin Strehlo, *PC Tools Hits the Jackpot in the Windows Shell Game*, INFOWORLD, Mar. 15, 1993, at 1.

173. 799 F. Supp. at 1047.

174. *See, e.g.*, M.A. EPSTEIN, MODERN INTELLECTUAL PROPERTY 379-85 (2d ed. 1989).

175. *See supra* note 137.

176. 799 F. Supp. at 1022-26.

to the "look and feel" test was the overall office desktop metaphor that pervaded the Macintosh interface.[177] According to the court this was a necessary strategy given the nature of the computer interface.

> Apple's theory is necessitated here because the actual arrangement of displays on a computer monitor running any interactive program is largely the product of the user's efforts, negating any claim of the programmer to original authorship. This arrangement or "look and feel" theory is further necessitated because use of graphic imagery of office objects in computer interfaces is indisputably unoriginal to Apple. But, more importantly, use of such objects or an arrangement of them denotes the "desktop metaphor," not as an idea unifying the expressive elements of the Macintosh interface but simply as a collection of visual displays and user commands designed to render use of the computer, as Apple's expert concedes, more "utilitarian."[178]

The court's starting position as to protecting the entire interface was that "[p]urely functional items or an arrangement of them for functional purposes are wholly beyond the realm of copyright."[179] This understanding led to the statement that "[t]he similarity of such functional elements of a user interface or their arrangement in products of like kind does not suggest unlawful copying, but standardization across competing products for functional considerations."[180] On this point, Microsoft's evidence which illustrated that almost all GUIs incorporate the same elements as the Macintosh interface,[181] was highly influential.

The court's view of the Macintosh interface as intrinsically utilitarian was reinforced by its economic analysis, as follows:

> Copyright's purpose is to overcome the public goods externality resulting from the non-excludability

177. *Id.* at 1023.

178. *Id.* at 1022-23 (footnote and citation omitted).

179. *Id.* at 1023.

180. *Id.*

181. Microsoft identified 29 past and present interfaces, 3 of which were character-based, all of which had overlapping Windows, 21 had iconic representation, 10 had object opening/closing, 20 had menus, and 19 iconic manipulation. *Id.* at 1024.

> of copier/free riders who do not pay the costs of creation. But overly inclusive copyright protection can produce its own negative effects by inhibiting the adoption of compatible standards (and reducing so-called "network externalities"). Such standards in a graphical user interface would enlarge the market for computers by making it easier to learn how to use them. Striking the balance between these considerations, especially in a new and rapidly changing medium such as computer screen displays, represents a most ambitious enterprise . . . .
>
> By virtue of having been the first commercially successful programmer to put these generalized features together, Apple had several years of market dominance in graphical user interfaces until Microsoft introduced Windows 3.0, the first DOS-based windowing program to begin to rival the graphical capability of the Macintosh. The Macintosh still to this day offers graphical features that translate into competitive advantages. To accept Apple's "desktop metaphor"/"look and feel" arguments would allow it to sweep within its proprietary embrace not only Windows and New Wave but, at its option, also other desktop graphical user interfaces which employ the standardized features of such interfaces, and to do this without subjecting Apple's claims of copyright to the scrutiny which courts have historically employed. Apple's copyrights would hold for programs in existence now or in the future—for decades. One need not profess to know for sure where should lie the line between expression and idea, between protection and competition to sense with confidence that this would afford too much protection and yield too little competition.[182]

Thus, Judge Walker refused to apply a substantial similarity analysis to what he considered the essentially functional, utilitarian, and/or unoriginal arrangement of the desktop metaphor. According to Judge Walker:

> The court declines Apple's invitation to use the advent of the microcomputer and its interface to abandon traditional standards which govern copyrights and in-

182. *Id.* at 1025-26 (citations omitted); *see* NIMMER, *supra* note 14, at ¶ 1.02[1],[2].

> vent some new law based on highly indefinite constructs such as "look and feel." As a result, if "desktop metaphor" is to have any meaning in the context of a traditional copyright analysis, it should serve merely as a label for that group of "ideas" embodied in the Macintosh interface devoted to utilitarian uses of that computer, or as a shorthand way of describing the purpose or object of the panoply of ideas of multiple windows, iconic representation and manipulation, menus and object opening and closing functions to assist computer users in operation of their machines. "Desktop metaphor" does not describe the single unifying idea of the Macintosh interface, but is simply another name for the type of interface used on the Macintosh and is by no means exclusive to it.[183]

In sum, Apple had failed with both its unorthodox "look and feel" and its more traditional elemental substantial similarity arguments. As a result, its only remaining argument was of virtual identity (actual copying) of several unlicensed, original elements. Judge Walker summarized as follows:

> Of [the items found unprotectible], only A1, D1, G4 and G5 could possibly be associated with unlicensed artistic expression to be compared under the "virtually identical" standard in the course of intrinsic analysis. This would be the appearance of the gray outline of a moving window, the change in appearance of icons when moving, and any special, non-functional artistic touches involved with the appearance of windows and icons that are overlapped, other than the art used to identify the active window, licensed item A4.[184]

3. The Inevitable Summary Adjudication

On August 10, three days after his ruling was announced, Judge Walker held a conference call with counsel,

183. 799 F. Supp. at 1026.

184. *Id.* at 1041. Subsequently, item G5 was removed from this list, Apple Computer, Inc. v. Microsoft Corp., No. C-88-20149-VRW, 1993 WL 207982, at *1, n.1 (N.D. Cal. 1993); *see* Jane Morrissey, *Ruling Dashes Apple's Interface Hopes; Ruling by U.S. District Judge Vaughn Walker on Copyright Infringement Case*, PC WK., Aug. 17, 1992, at 117; Paul Andrews, *Apple-Microsoft Settlement Now Likely*, SEATTLE TIMES, Aug. 8, 1992, at B8; *see supra* text accompanying note 133; Orenstein, *Why Apple Lost Microsoft Gamble*, AM. LAW. MEDIA, Apr. 17, 1992, at 1.

asking for briefs on the remaining issues to be filed by August 31, 1992.[185] Although, this haste presumably signaled the court's interest in promoting a settlement, Apple's public position was that Judge Walker's prior decisions would be appealed to the Ninth Circuit Court of Appeals.[186] The August discussion led directly to Judge Walker's order of April 14, 1993.[187] According to this order, "The principal outstanding issue is whether a jury could reasonably conclude that there is substantial similarity of licensed, protected expression between any of Apple's works and either Windows 2.03 or Windows 3.0, or between any of Apple's works and HP's New Wave."[188]

There were three aspects to this analysis: (1) three remaining Windows 2.03 elements;[189] (2) six remaining New Wave elements; and (3) an overall comparison between the interfaces.[190] Crucially, and consistent with his earlier approach to the "look and feel" issue, Judge Walker stated that he would apply the "virtual identity" test to all three of these issues. Noting circuit precedent to this effect,[191] Judge Walker asserted as follows:

> Common sense supports this conclusion. The fact that the work as a whole may be composed of a few individual elements protectible under the substantial similarity standard should not imply that the substantial similarity standard applies to the work as a whole. Here, the individual elements protectible under the substantial similarity standard constitute such a small and

185. 1993 WL 207982, at *1.

186. Jon Swartz, *Apple Plans to Appeal Ruling in Copyright-Infringement Suit*, MACWEEK, Sept. 14, 1992, at 64 (quoting Apple counsel Jack Brown). Apple's corporate position was that a decision to appeal had not been reached. Emily Barker, *Big Suits*, AM. LAW., Oct., 1992, at 89.

187. 1993 WL 207982, at *1. This order also clarified some points and inconsistencies in the prior order. *Id.*

188. *Id.*

189. Reduced from the four identified in the August, 1992 judgment. *See supra* note 184.

190. *See supra* note 184.

191. "[C]ompilations consisting largely of uncopyrightable elements receive only limited protection. As with factual compilations, copyright infringement of compilations consisting largely of uncopyrightable elements should not be found in the absence of 'bodily appropriation of expression.' " Harper House, Inc. v. Thomas Nelson, Inc., 889 F.2d 197, 205 (9th Cir. 1989).

> isolated part of the entire work that substantial similarity should not engulf the much larger number of unprotectible items by providing the appropriate standard for the entire work.[192]

Stating a tentative conclusion that such issues were for the jury, Judge Walker set a June 2, 1993 pre-trial conference and a June 28, 1993 trial date. However, he also scheduled a May 5, 1993 hearing on the defendants' motions for summary judgment and Apple's motion for reconsideration of the court's decision to use a virtual identity standard. On May 18, 1993, Judge Walker issued his rulings on these issues.[193]

First, Judge Walker addressed the three remaining elements previously identified as unprotectible under a substantial similarity standard but involving sufficient original artistic expression to be protectible under a virtual identity test.[194] These elements were overlapping rectangular windows over a muted background (item A1), simulating the movement of a Window by displaying a gray outline of the Window during a drag (D1), and the animation associated with dragging an icon around the desktop. In all three cases Judge Walker held that the Windows/New Wave implementations were not virtually identical to the Lisa-Macintosh.[195]

Second, Judge Walker decided similar issues regarding an additional six elements in New Wave. Of these elements Judge Walker found four that disclosed a jury issue on the question of virtual identity, rapid sequence of expanding and contracting Windows during iconization and maximization (G28 and G29), dimming an icon upon opening of a folder (G33), and the use of a trash can as a discard folder (H2).[196] Although only directed at New Wave, these four allegations implicated Microsoft because Apple was claiming contributory infringement by Microsoft.

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192. Apple Computer, Inc. v. Microsoft Corp., No. C-88-20149-VRW, 1993 WL 207982, at *2 (N.D. Cal. 1993).

193. 821 F. Supp. 616 (N.D. Cal. 1993).

194. *See supra* note 184.

195. 821 F. Supp. at 619-20.

196. *Id.* at 620-22.

Third, the court reiterated its ruling that in comparing Windows with Lisa-Macintosh as a whole the jury would be instructed on a virtual identity standard.[197] Similarly, the court maintained that the same standard would apply to the New Wave comparison with Apple's products.[198]

Fourth, Judge Walker denied Microsoft's motion for partial summary judgment on Apple's contributory infringement claim. As the court noted "Liability for contributory infringement arises when a defendant knowingly induces, causes, or materially contributes to the infringing activity."[199] Microsoft had argued that its relationship with Hewlett-Packard regarding New Wave should be characterized as "routine software developer behavior."[200] The court held that Apple had raised sufficient questions of material fact on this issue and Hewlett-Packard's related issue of joint and several liability with Microsoft to preclude summary judgment.[201] Judge Walker concluded in the following manner:

> In summary, the court will submit the following questions for the trial which is scheduled to commence on June 28, 1993: (1) Are items G28, G29 and G33 in all versions of New Wave and H2 in New Wave Developer's Release alone substantially similar to their equivalents in Apple's works? (2) Are any of HP's works as a whole virtually identical to any of Apple's works? (3) Are any of Microsoft's works as a whole virtually identical to any of Apple's works? (4) If any of HP's works infringe any of Apple's works, is Microsoft contributorily liable for any infringement on the part of HP? (5) If any of Microsoft's works infringe any of Ap-

197. *Id.* at 623.

198. *Id.* at 623-25. The court held that this standard should apply notwithstanding the arguable virtual identity of four New Wave items. This was because the court viewed those four elements quantitatively and qualitatively insignificant when comparing the works as a whole. *Id.* at 623-24.

199. *Id.* at 625 (citing Gershwin Publishing Corp. v. Columbia Artists Management, 443 F.2d 1159 (2d Cir. 1971); Casella v. Morris, 820 F.2d 362, 365 (11th Cir. 1987)).

200. 821 F. Supp. at 626.

201. *Id.* The court ruled on some additional matters at this time, ruling that H-P was a sub-licensee of Microsoft and thus similarly protected by the 1985 agreement. The court also disposed of some minor arguments regarding infringement of Macintosh Applets, and some process issues.

ple's works, is HP jointly and severally liable for any infringement on the part of Microsoft?[202]

Not surprisingly, a Microsoft spokesperson described the May 18 rulings as "extremely positive."[203] A few days later the three litigants agreed to remove the case from the court calendar.[204] The June 2 pre-trial conference proceeded as planned. Faced with Apple's motion of non-opposition to the defendants' motions for final summary judgment on the virtual identity issues, Judge Walker dismissed the case.[205] Presumably, Apple's non-opposition was to accelerate the inevitable entry of judgment in defendants' favor and to expedite an appeal.

In June, 1993 Apple C.E.O. John Sculley resigned,[206] and in September the company's vice president in charge of the Microsoft litigation was dismissed,[207] himself filing suit against Apple and incidentally arguing that Sculley had been forced out by the Apple board.[208] Meanwhile Apple reported serious economic losses,[209] and in an effort to restructure, Apple began laying off large numbers of workers.[210] Adding insult to injury, in July 1993 Apple and Hew-

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202. *Id.* at 631.

203. Samuel Perry, *Judge Narrows Scope of Key Apple Lawsuit Ruling Favors Microsoft, Hewlett-Packard in Closely Watched Software Case*, BUFFALO NEWS, May 20, 1993, at C3.

204. *No Jury Trial in Apple Suit*, N.Y. TIMES, May 29, 1993, at L35.

205. Jane Morrissey, *Judge Dismisses Apple Suit*, PC WK., June 7, 1993, at 21. Apple filed an appeal in late January 1994. *See* PC WK., Jan. 31, 1994, at 3.

206. Jonathan Weber, *Apple Computer's Sculley to Give Up CEO Position*, L.A. TIMES, June 19, 1993, at A1. Sculley became chairman of Spectrum Information Technologies. *See generally* N.Y. TIMES, Feb. 1, 1994, at D15, col. 5.

207. According to Apple he was laid off as part of their cost-cutting process. John Markoff, *Apple Executive is Let Go and Sues*, N.Y. TIMES, Sept. 25, 1993, at 19. The suit was dropped after Apple reinstated his severance benefits. SAN FRANCISCO CHRONICLE, Dec. 29, 1993, at B3.

208. Laura Evenson & Ken Siegman, *Suit Alleges Board Fired Sculley*, SAN FRANCISCO CHRON., Sept. 28, 1993, at B3.

209. The day after reporting its latest bad quarter results Apple shares plummeted 23%. Kathryn Jones, *Apple Stock is Hammered for 23% Loss*, N. Y. TIMES, July 17, 1993, § 1, at 35.

210. John Markoff, *Apple Executive is Let Go and Sues*, N.Y. TIMES, Sept. 25, 1993, § 1, at 39; *see also* John Markoff, *A Search for Direction at Apple*, N.Y. TIMES, Oct. 1, 1993, at D1. Apple's problems have been worsened by the generally lukewarm reception given to its Newton PDA (personal digital assistant), a product championed by Sculley, *cf.* Paul Andrews, *Let Me Spell It Out: Newton Doesn't De-*

lett-Packard filed papers with Judge Walker requesting approximately $10 million in attorneys' fees.[211]

V. THE RISE AND FALL OF "LOOK AND FEEL"

As demonstrated by the Windows litigation, conceptualizing and applying copyright law in computer software cases remains problematic.[212] In this section the various issues involved in "look and feel" litigation are discussed, as a prelude to an evaluation of the Windows case itself. Although famous for the visibility of some of its computer industry litigants, including Lotus Development, Inc., Symantec Corp., Borland International, Inc., and now Apple and Microsoft, the "look and feel" doctrine is relatively new and underdeveloped.[213]

In fact the "look and feel" question is as much a symptom of confusion in the resolution of software copyright cases as it is any discrete legal issue. As one court summarized the state of the law:

> [T]he case law and commentators in the area of copyright protection seem woefully ill-equipped to provide a systematic means for analyzing copyright issues as they arise in the context of computer software. Indeed, the heart of copyright law, designed to accommodate unimaginable varieties of creative expression, has mandated resolution of disputes on a case-by-case basis. What magnifies the underlying dilemma, however, is

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serve Earlier Pans, SEATTLE TIMES, Sept. 14, 1993, at D2, and by a price squeeze on its products caused by the tumbling prices of IBM-compatible machines.

211. AM. LAW. MEDIA, L.P., The Recorder, June 28, 1993, at 2. No specific number was given in the filing, but an H-P source was quoted as seeking $5 million. *Id.* Fantasy Inc. v. Fogerty, 984 F.2d 1524 (9th Cir. 1993), *cert. granted*, 113 S. Ct. 2992 (1993) (appeal on issue of attorneys' fees—underlying case concerning whether John Fogerty's solo song "The Old Man Down the Road" infringed copyright on "Run Through the Jungle" he recorded with Credence Clearwater Revival).

212. *See* NIMMER, *supra* note 14, at ¶ 1.03[1][2].

213. Notwithstanding, the "look and feel" approach to software copyright violations clearly is related to the more widely drawn "total concept and feel" approach. *See* Shaw v. Lindheim, 908 F.2d 531, 536 (9th Cir. 1990); Alotti v. R. Dakin & Co., 831 F.2d 898, 902 (9th Cir. 1987); Baxter v. MCA, Inc., 812 F.2d 421, 424 (9th Cir. 1987); Litchfield v. Spielberg, 736 F.2d 1352, 1356 (9th Cir. 1984); Roth Greeting Cards v. United Card Co., 429 F.2d 1106, 1110 (9th Cir. 1970).

> the realization that copyright law was not designed to accommodate computer software protection.[214]

The frequently arcane nature of the copyright inquiry aside, there are several reasons why interface cases have been difficult to resolve. First, conceptually, "look and feel" may be seen as going to copyrightability, or "substantial similarity," or both. Second, cases which are heralded as providing clarity frequently do so because they are single issue cases. For example, when there is direct evidence of copying, any "substantial similarity" inquiry is eliminated. Such precedents do not transfer well into the multiple issue case such as a situation where a court faces *both* copyrightability *and* "substantial similarity" issues.

Finally, many of the substantive issues are distorted by process considerations. For example, while the sub-text in many interface cases is one of jury control such as the extent to which the jury will be allowed to make a subjective, intrinsic comparison, many copyright cases are decided without a jury trial.[215] In addition, many copyright cases come up on motions for injunctive relief,[216] or on motions for summary judgment,[217] further distorting the substantive message of the case with procedural requirements.

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214. Gates Rubber Co. v. Bando Corp., 798 F. Supp. 1499, 1502 (D. Colo. 1992), *rev'd and remanded in part,* 9 F.3d 823 (10th Cir. 1993).

215. *See, e.g.,* Consul Tec, Inc. v. Interface Systems, Inc., No. 90-CV-70757-DT, 1991 WL 427891 (E.D. Mich. Oct. 31, 1991).

216. *See, e.g.,* Atari Games Corp. v. Nintendo of America, 975 F.2d 832, 837 (Fed. Cir. 1992); Rodesch v. Disctronics, Inc., 908 F.2d 977 (9th Cir. 1990) (granting a preliminary injunction); Johnson Controls, Inc. v. Phoenix Control Sys., Inc., 886 F.2d 1173 (9th Cir. 1989) (reviewing district court's decision to grant a preliminary injunction); Data East USA, Inc. v. Epyx, 862 F.2d 204 (9th Cir. 1988) (granting a permanent injunction); Autoskill, Inc. v. National Educ. Support Sys., Inc., 793 F. Supp. 1557, 1565 (D.N.M. 1992), *aff'd,* 994 F.2d 1476 (10th Cir. 1993) (granting a preliminary injunction). A district court may "grant temporary and final injunctions on such terms as it may deem reasonable to prevent or restrain infringement of a copyright." 17 U.S.C. § 502(a).

217. One leading software case summed up the summary judgment standard as follows:

> Summary judgment for a defendant accused of copyright infringement is appropriate when the plaintiff fails to show a genuine issue regarding whether the ideas and expressive elements of the works are substantially similar. This is so because the plaintiff bears the burden of proving that the allegedly infringing work is substantially similar to the work protected by plaintiff's copyright. A "genuine issue" exists when the plaintiff provides

In fact the interface protection cases deal with several different, yet not entirely discrete issues.[218] The first and what is only superficially the key issue is the explicit inquiry whether non-literal aspects of computer programs, specifically user interfaces, will be granted copyright protection. This issue will be referred to as the broad question of copyrightability. The second inquiry asks what is the role of the idea-"expression of idea" dichotomy in software cases? For example, does this narrow issue of copyrightability determine the protectibility of interfaces on a case-by-case basis? Third, should courts use a unified or multi-faceted test? This question is posed in two contexts: To what extent should questions of copyrightability and "substantial similarity" be treated collectively, and to what extent should courts develop multi-pronged tests for either or both of these issues? Finally, where courts have developed multi-faceted tests what are the relative weights that should be given to extrinsic and intrinsic judgments, and who should make such evaluations?

A. The Broad Question of Interface Copyrightability

This broad question of copyrightability would seem to be the key to the "look and feel" cases. However, this situation occurs only if you take an extreme position on the issue. An example of an extreme position is that there should be zero protection against the copying of non-literal aspects of a work.[219] More subtle questions include

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indicia of "a sufficient disagreement" concerning the substantial similarity of two works "to require submission to a jury."

Brown Bag Software v. Symantec Corp., 960 F.2d 1465, 1472 (9th Cir. 1992) (citations omitted).

218. *See* NIMMER, *supra* note 14, at ¶ 1.08, 1.09, 1.13.

219. *Cf.* Engineering Dynamics, Inc. v. Structural Software, Inc., 785 F. Supp. 576 (E.D. La. 1991):

> Plaintiff urges the court to follow the law of another jurisdiction and find that user interfaces (input and output reports) are copyrightable since they have evolved from ideas to expressions. . . . While the reasoning of *Lotus* may be persuasive, . . . this court is bound to follow the law of the Fifth Circuit. Under the law of this circuit, formats are not copyrightable. Plains Cotton Co-Op, Ass'n v. Goodpasture Computer Serv., Inc., 807 F.2d 1256, 1262 (5th Cir. 1987) . . . . [which] explicitly rejected Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc., 797 F.2d 1222 (3d Cir. 1986).

Id. at 582.

whether the "look and feel" of a program goes to substantial similarity analysis in the same way that "total concept or feel" is utilized in literary works.

One of the most frequently cited and criticized cases is *Whelan Associates, Inc. v. Jaslow Dental Laboratory*.[220] *Whelan* concerned a custom-designed record-keeping program for dental laboratories, non-literal aspects of which had allegedly been copied. The *Whelan* court's decision to protect non-literal aspects is relatively uncontroversial. However, it gave operational effect to that decision through the idea-expression dichotomy, adopting an idea-expression test which strongly favored finding an expression. *Whelan* therefore dramatically increased the level of copyright protection for the interface *per se*. Its rationale was that "[t]he rule proposed here, which allows copyright protection beyond the literal computer code, would provide the proper incentive for programmers by protecting their most valuable efforts, while not giving them a stranglehold over the development of new computer devices that accomplish the same end."[221]

In the process of answering the *broad* question of copyrightability, the *Whelan* court adopted a test for the *narrow* issue of copyrightability which was skewed in favor of interface protection.[222] While the *Whelan* approach to the narrow issue of copyrightability has attracted considerable dissent,[223] its broad copyrightability decision, that non-literal aspects are protectible, has found general support.[224]

220. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

221. *Id.* at 1237.

222. Holding an interface to be an expression, not an idea, makes it difficult to dissect or filter out the non-protectible aspects.

223. *See infra* text accompanying note 247.

224. *See, e.g.*, Lotus Dev. Corp. v. Borland Int'l, Inc., 799 F. Supp. 203, 214 (D. Mass. 1992) (citing *Computer Assocs.*, 982 F.2d 693 (2d Cir. 1992), Judge Keaton said that "the court explicitly approved determinations with respect to the copyrightability of certain nonliteral, noncode (nonstructural) aspects of the 1-2-3 spreadsheet in *Paperback*."); Brown Bag Software v. Symantec Corp., 960 F.2d 1465 (9th Cir. 1992) (implicit that "overall look and feel" is part of the intrinsic stage of the Ninth Circuit's bifurcated test); *see also* Mistretta v. Curole, No. CIV.A.92-0162, 1992 WL 28118 (E.D. La. Feb. 3, 1992); Lewis Galoob Toys, Inc. v. Nintendo of America, Inc., 780 F. Supp. 1283 (N.D. Cal. 1991); Consul Tec, Inc. v. Interface Systems, Inc., No. CIV.A.90-CV-70757, 1991 WL 427891 (E.D. Mich. Oct. 31, 1991) (non-literal aspects may be copyrighted); Broderbund Software, Inc. v. Unison World, Inc., 648 F.

This generally held position is reflected by *Johnson Controls, Inc. v. Phoenix Control Systems, Inc.*,[225] in which the Ninth Circuit asserted: "[w]hether the non-literal components of a program, including the structure, sequence and organization and user interface, are protected depends on whether, on the particular facts of each case, the component in question qualifies as an expression of an idea, or an idea itself."[226] The court considered a finding of copying to be sustainable, stating "[t]he special master's report sets forth, in detailed form, the various similarities between the programs. These similarities, both in idea and expression, would permit a reasonable person to find an unlawful appropriation, a capture by the infringing work of the 'total concept and feel' of Johnson's work."[227]

This approach is consistent with the leading case of *Computer Associates International, Inc. v. Altai, Inc.*,[228] which involved an operating system translator integrated into a mainframe scheduling program. The allegedly infringing software in question had all literal aspects of the copyrighted program removed, and replaced with a "clean-room" design.[229] Nevertheless, the court was prepared to extend protection even without copying of literal elements.[230] However, while endorsing the line of authority that had recognized the protection of non-literal elements,[231] *Computer Associates*

Supp. 1127 (N.D. Cal. 1986) (using the Ninth Circuit's bifurcated test and finding "substantial similarity").

225. Johnson Controls, Inc. v. Phoenix Control Sys., Inc., 886 F.2d 1173 (9th Cir. 1989).

226. *Id.* at 1175.

227. *Id.* at 1176 (footnote omitted).

228. Computer Assocs. Int'l, Inc. v. Altai, Inc., 982 F.2d 693 (2d Cir. 1992).

229. *Id.* at 700. I.e., the important issue related to version 3.5, not the literally copied 3.4.

230. *Id.* at 702-03.

231. According to *Computer Associates*:

> While computer programs are not specifically listed as part of the above statutory definition, the legislative history leaves no doubt that Congress intended them to be considered literary works.
>
> The syllogism that follows from the foregoing premises is a powerful one: if the non-literal structures of literary works are protected by copyright; and if computer programs are literary works, as we are told by the legislature; then the non-literal structures of computer programs are protected by copyright. See *Whelan*, 797 F.2d at 1234 ("By analogy to other

refused to allow the issue of copyrightability to be pre-empted.[232]

B. The Idea-"Expression of Idea" Dichotomy

It is trite doctrine that copyright law extends not to a mere idea but only to the expression of that idea.[233] As explained above, the idea-expression of idea dichotomy assumed importance in the user interface cases because it was thought that it was the key to copyrightability in this area.[234]

In *Whelan*, the defense took the position that "the structure of a computer program is, by definition, the idea and not the expression of the idea, and therefore that the structure cannot be protected by the program copyright."[235] The court rejected this approach and, in the process, formulated the following test:

> [T]he line between idea and expression may be drawn with reference to the end sought to be achieved by the work in question. In other words, the purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea.[236]

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literary works, it would thus appear that the copyrights of computer programs can be infringed even absent copying of the literal elements of the program."). We have no reservation in joining the company of those courts that have already ascribed to this logic. *See, e.g., Johnson Controls, Inc. v. Phoenix Control Sys., Inc.*, 886 F.2d 1173, 1175 (9th Cir. 1989); *Lotus Dev. Corp.*, 740 F. Supp. at 54; *Digital Communications Assocs., Inc. v. Softklone Distrib. Corp.*, 659 F. Supp. 449, 455-56 (N.D.Ga.1987); *Q-Co Industries, Inc. v. Hoffman*, 625 F. Supp. 608, 615 (S.D.N.Y.1985); *SAS Inst., Inc. v. S & H Computer Sys., Inc.*, 605 F. Supp. 816, 829-30 (M.D. Tenn.1985).

Id. (references omitted).

232. "However, that conclusion does not end our analysis. We must determine the scope of copyright protection that extends to a computer program's non-literal structure." *Id.* at 703 (references omitted). *See infra* text accompanying note 253.

233. *See supra* text accompanying note 79.

234. *See supra* text accompanying note 220; *see also,* Synercom Technology, Inc. v. University Computer Co., 462 F. Supp. 1003 (N.D. Tex. 1978) (suggesting no protection for non-literal aspects of computer program—because idea and expression not distinguishable).

235. Whelan Assocs., Inc. v. Jaslow Dental Lab., 797 F.2d. 1222, 1235 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

236. *Id.* at 1236.

Along with *Whelan,* the well-known case of *Lotus Development Corporation v. Paperback Software International*[237] is assumed to be the high point of interface protection. *Lotus* involved the plaintiff's famous 1-2-3 spreadsheet and the alleged infringement of Lotus's copyrights by the defendant's VP-Planner. *Lotus* was distinguished by a comprehensive and informed judgment written by the eminent jurist and scholar, Robert Keeton. As in *Whelan,* the central issue in *Lotus* was whether non-literal elements of computer programs were copyrightable.[238] As noted by Judge Keeton, copyright protection for artistic works extends beyond the literal expression to a protection of such non-literal aspects such as "the work's expression of setting, characters, or plot with a resulting substantial similarity."[239] Judge Keeton transported this concept to the user interface with the following language: "When computer programs include elements—both literal and nonliteral—'that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article,' they are potentially copyrightable."[240]

Subsequently, Judge Keeton somewhat downplayed the "look and feel" concept, viewing it as a conclusion rather than a helpful test on the question of copyrightability.[241] That approach was employed by Lotus, which suggested "that the copyrightable nonliteral elements are more appropriately described by the phrase 'user interface.' "[242] For Judge Keeton the dominant copyrightability issue in *Lotus* was whether 1-2-3 was an idea or an expression of an idea, a decision for which he proposed a three part test, as follows:

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237. 740 F. Supp. 37 (D. Mass. 1990).

238. "[D]efendants assert that only literal manifestations of computer programs are copyrightable. Plaintiff, on the other hand, maintains that copyright protection extends to all elements of computer programs that embody original expression, whether literal or nonliteral, including any original expression embodied in a program's 'user interface.' " *Id.* at 45-46.

239. *Id.* at 51.

240. *Id.* at 54 (citation omitted).

241. *Id.* at 62-63.

242. *Id.* at 63. For plaintiff, that meant "the menus (and their structure and organization), the long prompts, the screens on which they appear, the function key assignments, [and] the macro commands and language." *Id.*

> FIRST, in making the determination of "copyrightability," the decisionmaker must focus upon alternatives . . . along the scale from the most generalized conception to the most particularized, and choose some formulation—some conception or definition of the "idea"—for the purpose of distinguishing between the idea and its expression . . . .
> SECOND, the decisionmaker must focus upon whether an alleged expression of the idea is limited to elements essential to expression of that idea (or is one of only a few ways of expressing the idea) or instead includes identifiable elements of expression not essential to every expression of that idea.
> THIRD, having identified elements of expression not essential to every expression of the idea, the decisionmaker must focus on whether those elements are a substantial part of the allegedly copyrightable "work."[243]

Judge Keeton may have been less than enthusiastic regarding "look and feel" as a general test. Notwithstanding, his approach to deciding copyrightability rested heavily on a related concept, "[t]o determine copyrightability, a court need not—and, indeed, should not—dissect every element of the allegedly protected work. Rather, the court need only identify those elements that are copyrightable, and then determine whether those elements, considered as a whole, have been impermissibly copied."[244] For Judge Keeton, the Lotus 1-2-3 menu command structure passed his three part test.[245]

Lotus represents a major advancement in the *Whelan* approach because it used a far more sophisticated test for the idea-expression dichotomy. However, *Lotus* is not the definitive "look and feel" case as it is sometimes characterized. The only real issue in *Lotus* was copyrightability, since copying (infringement) in that case was obvious.[246] Although no friend of dissection, *Lotus* did not have to address the additional complication of "substantial similarity."

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243. *Id.* at 60-61 (upper case in original).
244. *Id.* at 67.
245. *Id.* at 65-68.
246. *Id.* at 68-70.

The joint determination of these issues can be seen in *Autoskill, Inc. v. National Educational Support Systems, Inc.*,[247] involving computer reading software. The *Autoskill* court adopted a bifurcated approach. That approach involved excluding unprotectible items prior to applying a substantial similarity test.[248] In dealing with the idea-expression dichotomy, the court rejected *Whelan*'s "more than one idea-then its an expression" approach.[249] The *Autoskill* court preferred the "abstractions" approach which originated with Judge Learned Hand in *Nichols v. Universal Pictures Corporation*,[250] and which was the first prong of Judge Keeton's legal test in *Lotus*.[251] When it came to the substantial similarity part of the analysis the court rejected a "look and feel" approach:

> First, the test is more appropriate when evaluating simplistic works where unanalytic evaluation is appropriate . . . . The importance of the role of the fact finder is stressed in the "total concept and feel" test and reliance on expert testimony is not appropriate. Furthermore, the term "concept" appears to contradict the rule that copyright protection be extended only to expression. Likewise the term "feel" is contrary to the necessity of analysis. In this case, the "total concept and feel" test would involve the impressions of the court as to the question of substantial similarity. Because the court did not operate the programs, in order to utilize this test I could only rely upon a few photos of selected screen displays and a logic flow chart. Such a determination would therefore not be meaningful. I would need to rely upon the explanations and impressions of the expert witnesses which is inappropriate. In addition, the

247. 793 F. Supp. 1557 (D.N.M. 1992), *aff'd*, 994 F.2d 1476 (10th Cir. 1993).

248. *Id.* at 1565.

249. This was rejected in the following terms:

> Autoskill urges me to accept the *Whelan* court's reasoning, however I decline to do so. The *Whelan* court's approach although, a temptingly simplistic and bright line test, cannot account for the reality that many ideas may exist in a given work. Adopting the *Whelan* rule would also put a damper upon the important goal of encouraging others to build upon the ideas conveyed in a work.

Id. (citations omitted).

250. 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

251. *See supra* text accompanying note 243.

> reading programs at issue here are complex. For all these reasons, I decline to utilize the "total concept and feel" test in this case.[252]

The synthesis of the *Nichols/Lotus* approach to the idea-expression dichotomy and the "substantial similarity" issue was taken to new heights in *Computer Associates,*[253] which adopted an "Abstraction-Filtration-Comparison" three-part test.

> [W]e think that district courts would be well-advised to undertake a three-step procedure . . . in order to determine whether the non-literal elements of two or more computer programs are substantially similar. This approach breaks no new ground; rather, it draws on such familiar copyright doctrines as merger, scénes á faire, and public domain . . . .
>
> In ascertaining substantial similarity under this approach, a court would first break down the allegedly infringed program into its constituent structural parts. Then, by examining each of these parts for such things as incorporated ideas, expression that is necessarily incidental to those ideas, and elements that are taken from the public domain, a court would then be able to sift out all non-protectible material. Left with a kernel, or possible kernels, of creative expression after following this process of elimination, the court's last step would be to compare this material with the structure of an allegedly infringing program. The result of this comparison will determine whether the protectible elements of the programs at issue are substantially similar so as to warrant a finding of infringement.[254]

A later court summarized the application of the first two parts of the test as follows:

> Judge Hand's abstraction analysis forces differentiation of the unprotectible idea and protectible expression. The abstraction method also properly recognizes that a computer program contains many distinct ideas . . . . By separating the program into manageable components, this method eases the court's task of discerning the boundaries of protectible expression.

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252. 793 F. Supp. at 1570 (citations omitted).

253. *See supra* text accompanying note 228.

254. Computer Assocs. Int'l v. Altai, Inc., 982 F.2d 693, 706 (2d Cir. 1992).

> After separating the program into manageable components, the court must next filter the unprotectible components of the program from the protectible expression. The court must filter out as unprotectible the ideas, expression necessarily incident to the idea, expression already in the public domain, expression dictated by external factors (like the computer's mechanical specifications, compatibility with other programs, and demands of the industry served by the program), and expression not original to the programmer or author.[255]

Subsequent to *Computer Associates*, Judge Keeton decided *Lotus Development Corporation v. Borland International, Inc.*,[256] in which the plaintiff alleged that the 1-2-3 copyrights were infringed by the defendant's Quattro Pro "emulation" or "1-2-3 compatible" interface. Using this interface, users familiar with Lotus 1-2-3 commands could directly operate Quattro Pro, which has a different native command interface.[257] In *Borland*, the court was spared the difficulties associated with the "substantial similarity" inquiry, because of direct evidence of copying.[258] The dominant issue, therefore, was one of copyrightability. Judge Keeton made extensive reference to the Second Circuit's opinion in *Computer Associates*.[259] However, he concluded that *Computer Associates'* "Abstraction-Filtration-Comparison" three-prong test for "substantial similarity" was

255. Atari Games Corp. v. Nintendo of America, 975 F.2d 832, 838-39 (Fed. Cir. 1992) (citations omitted). *See also* Gates Rubber Co. v. Bando Chemical Industries, Ltd., 9 F.3d 823, 824 (10th Cir. 1993).

256. 799 F. Supp. 203 (D. Mass. 1992). The appeal is pending following Judge Keeton's granting of a preliminary injunction. Judge Keeton has scheduled a trial on damages for October 1994. Jane Morrissey, *Borland Readies Its Appeal Following a Court Injunction*, PC WK., Aug. 23, 1993, at 8.

257. A growing number of programs have application-migration help. For example, both Microsoft's Word for Windows 2.0 and Lotus Development's Ami Pro 3.0 offer "help" for WordPerfect users. However, the accepted distinction between these functions and the Lotus-Borland dispute is that the 1-2-3 commands could be executed directly from the interface, rather than routing users through a "translator." For example, calling up WordPerfect Help in Word for Windows 2.x displays a dialog box from which the user selects a WordPerfect function. The program then plays a demonstration of Word for Windows performing the equivalent function.

258. 799 F. Supp. at 208.

259. *See supra* text accompanying note 228.

consistent with his own *Lotus* test. According to Judge Keeton:

> The Second Circuit founded its abstraction step on the opinions of Judge Learned Hand that were also the foundation of the first step of the copyrightability test stated in my Memorandum and Order. The second step of that copyrightability test parallels the Second Circuit's "filtration" step.
>
> The third step of the Second Circuit test, "comparison," serves two functions. The first concerns the issue addressed in the third step of the "copyrightability" test I have tentatively adopted for this case—whether the expressive elements of the allegedly copyrightable work are a substantial part of it. I conclude that in this respect the two tests are compatible substantively though different in methodology. The other function that the Second Circuit's "comparison" step serves is emphasized in the term used to identify it—"comparison." The comparison is between the relevant portions of the allegedly infringing work and the expressive elements of the allegedly copyrightable work to ascertain whether any part of the allegedly infringing work is similar to expressive elements of the allegedly copyrightable work that are a substantial part of the allegedly copyrightable work (i.e., whether there is substantial similarity in the mixed law-fact sense). I conclude, again, that in relation to this comparison, the Second Circuit's test and the combination of the "copyrightability" and "substantial similarity" tests I have adopted tentatively are compatible substantively, though different in methodology.[260]

If *Lotus* and *Computer Associates* had much in common regarding their approach to copyrightability, the latter case distinguished itself with an unambiguous rejection of the *Whelan* approach to the idea-expression dichotomy. According to the Second Circuit, *Whelan* was based on a false premise, that a computer program contained only one idea:

> This criticism focuses not upon the program's ultimate purpose but upon the reality of its structural design. As we have already noted, a computer program's ultimate

260. 799 F. Supp. at 211-12.

> function or purpose is the composite result of interacting subroutines. Since each subroutine is itself a program, and thus, may be said to have its own 'idea,' *Whelan*'s general formulation that a program's overall purpose equates with the program's idea is descriptively inadequate.
>
> Accordingly, we think that Judge Pratt [in the District Court] wisely declined to follow *Whelan*. In addition to noting the weakness in the *Whelan* definition of "program-idea," mentioned above, Judge Pratt found that *Whelan*'s synonymous use of the terms "structure, sequence, and organization" demonstrated a flawed understanding of a computer program's method of operation. Rightly, the district court found *Whelan*'s rationale suspect because it is so closely tied to what can now be seen—with the passage of time—as the opinion's somewhat outdated appreciation of computer science.[261]

C. Copyrightability and Substantial Similarity

Although *Whelan* noted the use by other courts of a bifurcated test for substantial similarity, it preferred a unified test.[262] Its rationale was primarily a negative view of the "ordinary observer" test which makes up the second prong of many bifurcated tests, doubting its usefulness in complex computer software cases.

The court in *Computer Associates*, with its "Abstraction-Filtration-Comparison" approach,[263] clearly saw the issues of copyrightability and "substantial similarity" to be intermingled. Equally, however, and as recognized by Judge Keeton in *Borland*,[264] abstraction and filtration tend to go to copyrightability, whereas comparison goes to "substantial similarity."[265]

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261. *Computer Assocs.*, 982 F.2d at 705-06 (citations omitted).

262. Whelan Assocs., Inc. v. Jaslow Dental Lab., Inc., 797 F.2d 1222, 1232-33 (3d Cir. 1986).

263. *See supra* text accompanying note 254.

264. *See supra* text accompanying note 260.

265. *See, e.g.*, Atari Games Corp. v. Nintendo of America, 975 F.2d 832, 838-40 (Fed. Cir. 1992) (applying first two elements of the *Computer Associates* test to determine copyrightability).

In fact, *Computer Associates* seems to have placed renewed emphasis on the issue of copyrightability at the expense of the substantial similarity issue in interface cases, noting the following:

> While, hypothetically, there might be a myriad of ways in which a programmer may effectuate certain functions within a program,—i.e., express the idea embodied in a given subroutine—efficiency concerns may so narrow the practical range of choice as to make only one or two forms of expression workable options.
>
> Efficiency is an industry-wide goal. Since, as we have already noted, there may be only a limited number of efficient implementations for any given program task, it is quite possible that multiple programmers, working independently, will design the identical method employed in the allegedly infringed work. Of course, if this is the case, there is no copyright infringement.
>
> Under these circumstances, the fact that two programs contain the same efficient structure may as likely lead to an inference of independent creation as it does to one of copying. *Thus, since evidence of similarly efficient structure is not particularly probative of copying, it should be disregarded in the overall substantial similarity analysis.*[266]

D. Extrinsic and Intrinsic Judgments

In *Sid & Marty Krofft Television v. McDonald's Corp.*,[267] the Ninth Circuit adopted a bifurcated test for "substantial similarity,"[268] beginning with a factual inquiry as to any substantial similarity of ideas:

> We shall call this the "extrinsic test." It is extrinsic because it depends not on the responses of the trier of fact, but on specific criteria which can be listed and analyzed. Such criteria include the type of artwork in-

266. Computer Assocs. Int'l, Inc. v. Altai, Inc., 982 F.2d 693, 708 (citations omitted, emphasis added).

267. Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157 (9th Cir. 1977).

268. The test dates back to Arnstein v. Porter, 154 F.2d 464 (2d Cir. 1946), *cert. denied*, 330 U.S. 851 (1947); *see also* Gates Rubber Co. v. Bando Corp., 798 F. Supp. 1499, 1513-14 (D. Colo. 1992), *rev'd and remanded in part*, 9 F.3d 823 (10th Cir. 1993).

> volved, the materials used, the subject matter, and the setting for the subject. Since it is an extrinsic test, analytic dissection and expert testimony are appropriate. Moreover, this question may often be decided as a matter of law.
>
> The determination of when there is substantial similarity between the forms of expression is necessarily more subtle and complex . . . . The test to be applied in determining whether there is substantial similarity in expressions shall be labeled an intrinsic one—depending on the response of the ordinary reasonable person. It is intrinsic because it does not depend on the type of external criteria and analysis which marks the extrinsic test . . . . Because this [test] is an intrinsic test, analytic dissection and expert testimony are not appropriate.[269]

What *Krofft* failed to do was to incorporate any copyrightability analysis into its two prong test. This step was provided by the court in *Aliotti v. R. Dakin & Co.*[270]

> To the extent that it is necessary to determine whether similarities result from unprotectible expression, it is appropriate under *Krofft*'s intrinsic test to perform analytic dissection of similarities. Although even unprotectible material should be considered when determining if there is substantial similarity of expression no substantial similarity may be found under the intrinsic test where analytic dissection demonstrates that all similarities in expression arise from the use of common ideas.[271]

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269. *Sid & Marty Krofft Television Prods., Inc.*, 562 F.2d at 1164; *see* Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986) (applying this test in a software case). Even in the absence of a formally bifurcated test, other courts apply similar concepts. *See, e.g.*, Durham Indus., Inc. v. Tomy Corp., 630 F.2d 905 (2d Cir. 1980); Reyher v. Children's Television Workshop, 533 F.2d 87 (2d Cir. 1976), *cert. denied*, 429 U.S. 980 (1976); Ideal Toy Corp. v. Fab-Lu Ltd., 360 F.2d 1021 (2d Cir. 1966); *see also* Little Souls, Inc. v. Petits, 789 F. Supp. 56, 57 (D. Mass. 1992) (espousing apparently different two-part test, "copying" inquiry followed by "illicit copying" inquiry).

270. Aliotti v. R. Dakin & Co., 831 F.2d 898 (9th Cir. 1987).

271. *Id.* at 901 (citation omitted). In a subsequent opinion, the court summed up the modification to *Krofft* as follows:

> We have inserted a third part to Krofft's substantial similarity test between the intrinsic and extrinsic tests. The third part of the test examines whether the idea and its expression are "separable." If the idea and expression are inseparable, we will not find substantial similarity because that "would confer a monopoly of the idea upon the copyright owner." We can analytically

Subsequently, in *Brown Bag Software v. Symantec Corp.*,[272] the court clarified this utilization of dissection as applying also to the expression of the idea.

> Under the original formulation of *Krofft*'s "extrinsic" component, a plaintiff needed to prove only the "similarity of ideas" in the two programs. Today, however, the extrinsic test looks at more than just the similarity of ideas. The extrinsic test . . . has become an "objective . . . analys[is] of expression."
>
> To establish infringement of a copyright, the two works in question must also meet the second component of the test set forth in *Krofft*, the "intrinsic test." The intrinsic test, according to *Krofft*, should measure "substantial similarity in expressions . . . depending on the response of the ordinary reasonable person . . . . [I]t does not depend on the type of external criteria and analysis which marks the extrinsic test." In applying the intrinsic test, therefore, "analytic dissection and expert testimony are not appropriate" . . . . Under the reformulated extrinsic test, we mean to perpetuate "analytic dissection" as a tool for comparing not only ideas but also expression.[273]

Brown Bag's commitment to dissection at the copyrightability and copying stages of the analysis[274] dramatically reduces the level of protection for interfaces, running counter to the more gestalt approach to protecting non-literal aspects.

> dissect similarities in expression between works to determine whether all similarities in expression necessarily arise from the use of common ideas.

Rodesch v. Disctronics, Inc., 908 F.2d 977 (9th Cir. 1990) (citations omitted) (full text of case available on Westlaw).

272. 960 F.2d 1465 (9th Cir. 1990), *cert. denied*, 113 S. Ct. 198 (1992).

273. *Id.* at 1475 (citations omitted).

274. As *Brown Bag* related:

> Analytic dissection is relevant not only to the copying element of a copyright infringement claim, but also to the claim's ownership element. One aspect of the ownership element is the copyrightability of the subject matter and, more particularly, the scope of whatever copyright lies therein. To the extent a plaintiff's work is unprotected or unprotectable under copyright, the scope of the copyright must be limited. . . . Thus, where two works are found to be similar without regard to the scope of the copyright in the plaintiff's work . . . the source of the similarity must be identified and a determination made as to whether this source is covered by plaintiff's copyright.

Id. at 1476 (citations and footnote omitted).

Indeed, with *Brown Bag* the Ninth Circuit completed the movement away from *Whelan*, and it substantially reduced non-literal copyright protection for the interface. The *Whelan* court had sought to extend general protection to non-literal aspects by using an idea-expression test that dramatically favored the latter. Subsequent cases such as *Lotus* and *Computer Associates*[275] took a more centrist approach to the dichotomy by using multi-faceted tests which involved considerable dissection or filtration. *Brown Bag* confirmed the reach of such dissection.

CONCLUSION—EVALUATING THE WINDOWS LITIGATION

Copyright continues to be the dominant and, arguably, the most appropriate[276] method for the protection of intellectual property in software. However, as the "look and

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275. According to *Computer Associates*,

> [i]nitially, in a manner that resembles reverse engineering on a theoretical plane, a court should dissect the allegedly copied program's structure and isolate each level of abstraction contained within it. This process begins with the code and ends with an articulation of the program's ultimate function. Along the way, it is necessary essentially to retrace and map each of the designer's steps—in the opposite order in which they were taken during the program's creation. . . .
>
> Once the program's abstraction levels have been discovered, the substantial similarity inquiry moves from the conceptual to the concrete. . . . This process entails examining the structural components at each level of abstraction to determine whether their particular inclusion at that level was "idea" or was dictated by considerations of efficiency, so as to be necessarily incidental to that idea; required by factors external to the program itself; or taken from the public domain and hence is nonprotectable expression. . . .
>
> Once a court has sifted out all elements of the allegedly infringed program which are "ideas" or are dictated by efficiency or external factors, or taken from the public domain, there may remain a core of protectable expression. In terms of a work's copyright value, this is the golden nugget. At this point, the court's substantial similarity inquiry focuses on whether the defendant copied any aspect of this protected expression, as well as an assessment of the copied portion's relative importance with respect to the plaintiff's overall program.

Computer Assocs. Int'l, Inc. v. Altai, Inc., 982 F.2d 693, 707-710 (2d Cir. 1992) (citations omitted).

276. Pamela Samuelson, *Benson Revisited: The Case against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025 (1990). *See* NIMMER, *supra* note 14, at ¶ 2.05 (quoting guidelines issued by Patent and Trademark Office).

feel" approach continues to decline, software developers will be forced to look elsewhere for protection for their interfaces.[277] If the most difficult "look and feel" issues arise in user interface cases then the ultimate "look and feel" issue must arise in operating system interface cases. As millions of PC users embraced Windows 3.0 and beyond, the struggle for legal control of the graphical interface quickly escalated. Clearly the implications were not lost on Judge Walker:

> The underlying economic and legal issue in copyright is the tradeoff between the social benefits of increased production of useful ideas brought about by giving a copyright holder the monopoly protection afforded copyrighted works and the social costs imposed by raising the marginal cost of using copyrighted works. Courts are repeatedly called upon to resolve the tensions inherent in this tradeoff.[278]

At the very least, the GUI wars which played out in the district court in San Francisco have highlighted those tensions. The irony is that as the Windows litigation made its painfully slow journey from motion to motion, copyright law as it applies to computer software was making rapid progress. That progress primarily was in the area of copyrightability. Not only did the courts demonstrate renewed vigor in applying the idea-expression dichotomy, but

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277. For example, Microsoft was recently denied trademark protection for Windows, for which it applied in 1990. Protection was refused on the basis that Windows was already a term of art in the computer industry when Microsoft introduced Windows 1.0. "[T]he evidence clearly demonstrates that the public understands the term Windows to refer to a genus of goods, namely computer software which utilizes windows on a computer screen. . . ." Edmond L. Andrews, *Microsoft Trademark Setback*, N.Y. TIMES, Feb. 25, 1993, at D1 (quoting U.S. Patent and Trademark Office). Microsoft has announced an appeal. Shawn Willet, *Microsoft to Appeal Denial of Windows Trademark*, INFOWORLD, Mar. 1, 1993, at 3. Microsoft has also issued a statement that it "gained ownership of the Windows trademark through its extensive use of the mark and industry wide recognition of its successful Windows product." James Coates, *Microsoft Tries to Close a Window to Competitors*, CHI. TRIB., Mar. 1, 1993, at C3.

Changes in traditional legal protections for computer products have led to renewed interest in trade secret law. *See, e.g.*, Victoria Slind-Flor, *More Trade Secret Laws*, NAT'L L.J., Mar. 22, 1993, at 1.

278. Xerox Corp. v. Apple Computer, Inc., 734 F. Supp. 1542, 1544-45 (N.D. Cal. 1990) (citation and footnote omitted).

also it significantly loaded, on the front-end, the infringement analysis with the copyrightability inquiry.

Clearly, the Windows case was decided on the basis that "look and feel" will not preclude analytic dissection. As Judge Walker himself asserted:

> Without dispute, a copier may not make "immaterial variations" and thereby escape copyright liability . . . and, to this limited extent, there is some legitimacy to a "look and feel" test, a point this court previously recognized . . . . But this test should be applied only after protectible expression has been identified, not before, as Apple would have this court do.[279]

If dissection is the clearest barrier to comprehensive protection of the computer interface, it is a barrier that Judge Walker erected with great care in the Windows litigation. In large part dissection was inevitable because the licensing agreement had to be interpreted. Crucially, it was mandated because of the Ninth Circuit's extrinsic test as most recently expressed in *Brown Bag*. It is no coincidence that the district court in *Brown Bag*[280] took a very similar approach to Judge Walker in the Windows case,[281] an approach that was upheld by the Ninth Circuit.[282]

The specifics of dissection aside, Apple's greatest enemy was time. When first filed in March 1988, Apple's theory of liability was consistent with the leading software

279. Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp 1006, 1026 n.16 (N.D. Cal. 1992); *cf.* Gates Rubber Co. v. Bando Corp., 798 F. Supp. 1499 (D. Colo. 1992), *rev'd and remanded in part,* 9 F.3d 823 (10th Cir. 1993). In *Gates,* the court stated that the extrinsic and intrinsic tests would be followed by the "abstractions" test, "to ensure that the substantial similarity test, and in particular the two-pronged test, does not allow for the protection of any unprotectable ideas . . . ." *Id.* at 1513-14. The court considered that this dissection phase should follow the two-prong test, considering that to do it beforehand would run counter to established caselaw and would eviscerate the substantial similarity test. *Id.* at 1516-17.

280. *Sub. nom.* Telemarketing Resources v. Symantec Corp., No. C-88-20352-RPA, 1989 WL 200350 (N.D. Cal. Sept. 6, 1989).

281. However, overall "look and feel" had not been argued before the district court in *Brown Bag* on the particular summary judgment motion that precipitated the appeal to the Ninth Circuit. Brown Bag Software v. Symantec Corp., 960 F.2d 1465, 1476 (9th Cir. 1992).

282. Professor Samuelson has suggested that *Brown Bag* was a decisive factor in Judge Walker's approach to his April 1992 rulings. Pamela Samuelson, *Updating The Copyright Look And Feel Lawsuits,* COMMUNICATIONS OF THE ACM. Sept., 1992, at 25.

caselaw. By the time Judge Walker issued his opinion in August, 1992, copyright law had evolved past the Apple assertions.